ENVIRONMENTAL IMPACT ANALYSIS PROCESS

GROOM MOUNTAIN RANGE

LINCOLN COUNTY, NEVADA

ARCHAEOLOGICAL RECONNAISSANCE

AUGUST 1986

AN ARCHAEOLOGICAL RECONNAISSANCE OF THE GROOM RANGE
LINCOLN COUNTY, NEVADA

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ABSTRACT

The Social Sciences Center, Desert Research Institute, has conducted a Class II cultural resources reconnaissance covering six percent of approximately 362.75 square km of land in the Groom Range, Lincoln County, Nevada, which the U.S. Air Force proposes to withdraw from public access.

The six percent sample was composed of eight-five 500 x 500 m square quadrats dispersed throughout the proposed withdrawal. This sample was supplemented by intuitive visits to springs and sites recorded during travel.

Two hundred and sixty-five archaeological sites have now been recorded in the withdrawal area. Only two of these sites were previously recorded. Prehistoric and ethnohistoric sites were categorized into eight site types representing a broad range of activity: temporary camps, milling stations, quarries, knapping stations, lithic scatters, localities, and isolates. Historic sites were classified into mining, ranching, transportation, and logging sites. Sites range in age from Paleoindian (up to around 11,000 years old) times to present, with most remains dating to the most recent 3,000 years of this sequence.

Since the proposed use of the Groom Range by the Air Force is as a buffer zone, there are few potential activities envisioned that will directly impact cultural resources. Overall, the withdrawal will be beneficial for cultural resources due to the resulting restriction of public access to the area. It is recommended that a policy for managing cultural resources in the project area should be developed by the Air Force in conjunction with the Bureau of Land Management and the Nevada Division of Historic Preservation and Archaeology.

ACKNOWLEDGMENTS

We would like to thank Colonels Robert Smith and Shelby Friend, U.S. Air Force, for their untiring efforts as liaison officers for the project. Every effort was made by personnel on Nellis Air Force Base. to provide logistic support for the project and to facilitate operations by the field crew. Mr. Thomas M. Humphrey and Mr. Ernest B. Williams, of the Department of Energy (DOE), as well as, Dr. Gilbert Cochran, Mr. Nate Cooper, and Dr. John Fordham, of the Water Resources Center-Desert Research Institute (WRC-DRI), also provided valuable logistical support.

Daniel and Patrick Sheahan generously provided access to the Groom Mine, relevant documents, and a lengthy interview concerning local mining history. Alvin McLane was consulted concerning the early history of the area and provided the instructions for locating Snowslide Cave.

The staffs at the Nevada Historical Society in Reno and Las Vegas, the University of Nevada Special Collections Libraries in Reno and Las Vegas, the University of Nevada Reno Serials Department, Bureau of Land Management Las Vegas District Office, Environmental Research Consultants, and the Nevada State Museum assisted our efforts at collecting background information.

Field work was enhanced by simultaneous investigation by members of the Environmental Impact Statement (EIS) team who are specialists in water resources, geology, soils, climate, vegetation, and animal life. The interchange of information concerning the project area was invaluable. Portions of their contributions to the Groom Mountain Range Draft Environmental Impact Statement (DEIS) make up much of the background material for this report.

The most arduous task in any archaeological project is the collection of data from the field. The Groom Range field crew included Nate Cooper, Evan Crabtree, Sandra Day, Anne DuBarton, Douglas W. M. Rennie, and Richard Ryan. To each we owe a special debt of gratitude.

Lab work and computer data entry was done by Cari Lockett, Sue Ann Monteleone, Calvin Nichols, and Lucy Elston. Computer analysis was done by Stephen Durand, drafting performed by Gail Townsend, and lab photography done by Carol Bailey.

Logistic details at Desert Research Institute were handled by Barbara Giles and Mary Jane Smith. The text was processed by Ramona Livingston. Gregory Henton and Ramona Livingston assisted in the final editing of the manuscript.

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1. INTRODUCTION

At the request of the U.S. Air Force, the Social Sciences Center, Desert Research Institute has conducted a Bureau of Land Management Class II (sample) cultural resources reconnaissance of six percent of the Groom Range withdrawal. The objective of this literature review and reconnaissance has been to obtain a scientifically based, representative sample of the cultural resources in the Groom Range to 1) assist in the decision making process concerning the renewed withdrawal of the Groom Range, and 2) assure protection of significant (National Register of Historic Places quality) cultural resources within the withdrawal area.

The United States Air Force proposes to renew the withdrawal of approximately 89,600 acres (362.75 square km.), of public land in the Groom Range from settlement, sale, location, or entry under the public land laws of the United States, including the mining laws but not the mineral and geothermal leasing laws.

The proposed renewed withdrawal would provide a buffer zone between public lands and the Nellis Air Force Range Nevada Test Site complex where training, testing and weapons evaluation operations for the Air Force and other Federal agencies with defense related programs are conducted (Figure 1-1). This buffer is to prevent compromising safety and national security.

No greater adverse impact on the withdrawn land and its resources is foreseen than overflights pursuant to the military tactical training. The withdrawn area may be fenced to exclude entry by unauthorized personnel and animals which might affect the military missions being conducted in or over the withdrawn areas. This renewed withdrawal is proposed in compliance with the Act of 1984, Public Law 98-485, and pursuant to the Act of 1958, Public Law 85-337, known as the Engle Act and Public Law 94-579, The Federal Land Policy and Management Act of 1976 (FLPMA), and Department of Air Force Guidelines (AFR 19-2).

The National Environmental Policy Act (NEPA) of 1969 (PL 91-190) insures that the environmental impacts of renewed withdrawal of the Groom Mountain Range land will be addressed. Additionally, NEPA requirements support FLPMA requirements in that Congress must be provided documentation of the environmental and economic impacts; a clear explanation of the proposed use of the land; evaluation of the natural resources; and possible alternatives. The proposed renewal of withdrawal would be for a period of 25 years with an option to renew for 25 additional years.

In recognition of these national defense needs, and in accordance with the various Public Land Orders, the Engle Act, FLPMA, and NEPA, Environmental Impact Statements (EIS) were prepared in 1977 and 1981 for continued withdrawal of Nevada Test Site and Nellis AF Range respectively. After the Final EIS for Nellis AF Range had been issued, the withdrawal application submitted to Congress was amended by the Air Force and Department of Interior, DOI, to include the Groom Mountain Range area, although the area had not been specifically addressed in the EIS.

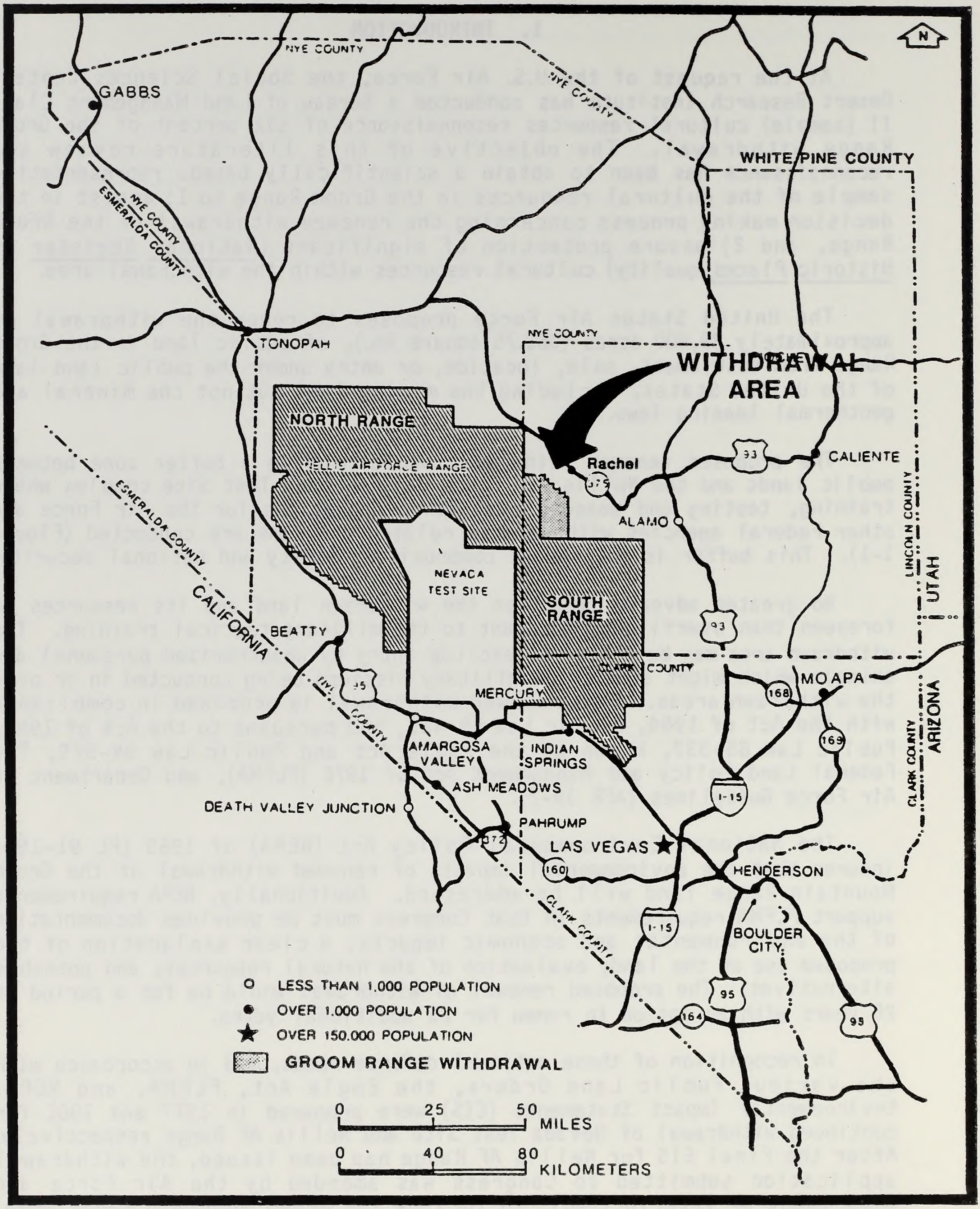

Figure 1-1: Generalized Location Map, Groom Range Withdrawal, Lincoln County, Nevada.

In acting on the Nellis Air Force Range withdrawal application, Congress excluded the Groom Mountain Range. Withdrawal of the Groom Mountain Range addition to Nellis AF Range was accomplished under separate Congressional Legislation (PL 98-485) in October 1984. The approved withdrawal is temporary (expiring December 31, 1987), during which time the Air Force and DOI are to prepare an EIS concerning the continued or renewed withdrawal.

Beginning in 1979, in the interest of public safety and national defense, the Air Force began actively discouraging, and at times preventing, any public or private entry to the Groom Range. This practice continued until October 1984 when Congress provided the authority for control of access through withdrawal under PL 98-485.

This analysis of cultural resources in the Groom Range is organized as follows: introductory chapters are devoted to the cultural and natural background of the project area, and the methods involved in performing field work. The presentation of archaeological data is divided into three chapters (4-6) corresponding to convenient levels of analyzing archaeological remains. The most basic approach is at the level of the artifact or artifact class. This is done in Chapter 4. Chapter 5 is devoted to a study of archaeological sites, features, and the distribution of archaeological remains in the project area. Our findings are briefly summarized in Chapter 6. Chapter 7 considers future management of cultural resources in the project area. A summary of a selected portion of the data collected from each sample unit are presented in Appendix A.

2. THE PROJECT AREA

The Natural Setting

Topography

The withdrawal area is situated in the Basin and Range Physiographic Province which is characterized by north-south trending block faulted mountain ranges separated by broad alluvium filled valleys. The withdrawal runs north-south a distance of approximately 19 miles with elevations ranging from 4437 feet above Mean Sea Level (M.S.L.) at Groom Lake bed to 9380 feet at the peak of Bald Mountain locally known as Mount Baldy (Figure 2-1). The Groom Range itself is characterized by steep upland areas rising from an elevation of 6000 feet to over 9000 feet over a distance of less than 3 miles along both the east and west sides (Figure 2-2). Slopes below 6000 feet along the south and east sides are much less steep and not as dissected as the upland areas.

Topography is closely related to bedrock formations. Quartzite and volcanics form steep rounding slopes whereas the massive limestones and dolomites form rugged areas with prominent cliffs. Shales and thin-bedded limestone erodes easily and form low lying drainage areas (Humphrey 1945:12-13). Location of bedrock units and faulting have created several distinct sub-areas within the range, all oriented north to south. The western edge of the project area is along the rugged west escarpment of the quartzite exposures (Figure 2-3). This escarpment is penetrated by a few valleys, all of which have served to channel cultural activities through the bleak and rugged Quartzite Hills (Figure 2-4). Between the Quartzite Hills and the main crest of the Groom Range lies a protected valley (Naquinta Valley) somewhat broken up into small drainage basins by minor ridges (Figure 2-5). The higher portions of this valley are covered by dense pinyon-juniper and are well-watered (Figure 2-6). From north to south, the main ridge is made up of quartzite, volcanics, and carbonates, with the varying morphology noted above; the ridge is rounded with many excellent saddles in quartzite and volcanic areas (Figure 2-7), and sharp in carbonate areas (Figure 2-8). A gentle valley (Quail Valley) ranging from 3 to 6 miles wide occupies the east side of the range. This valley is bordered on the east by the rugged volcanic Tikaboo Hills. As with the Quartzite Hills on the west side of the range, there are several narrow valleys through the hills which provide excellent routes of travel. Only the main crest continues to the extreme north end of the range.

Geology*

The Groom Range is an east-tilting fault block that exposes great thicknesses of Cambrian, Ordovician, and Devonian rocks partly buried by volcanic rocks. The oldest rocks, Prospect Mountain Quartzite, are more than 7,800 feet thick and makeup most of the west half of the range. The total exposed Cambrian section may exceed 20,000 feet. Conglomerate of pre-Miocene age out crop from beneath the volcanic rocks on the northwest flank of the range. Similar rocks probably underlie the volcanic rocks along the southeastern side of the range.

*Largely derived from the Groom Mountain Range DEIS (1985:3-7).

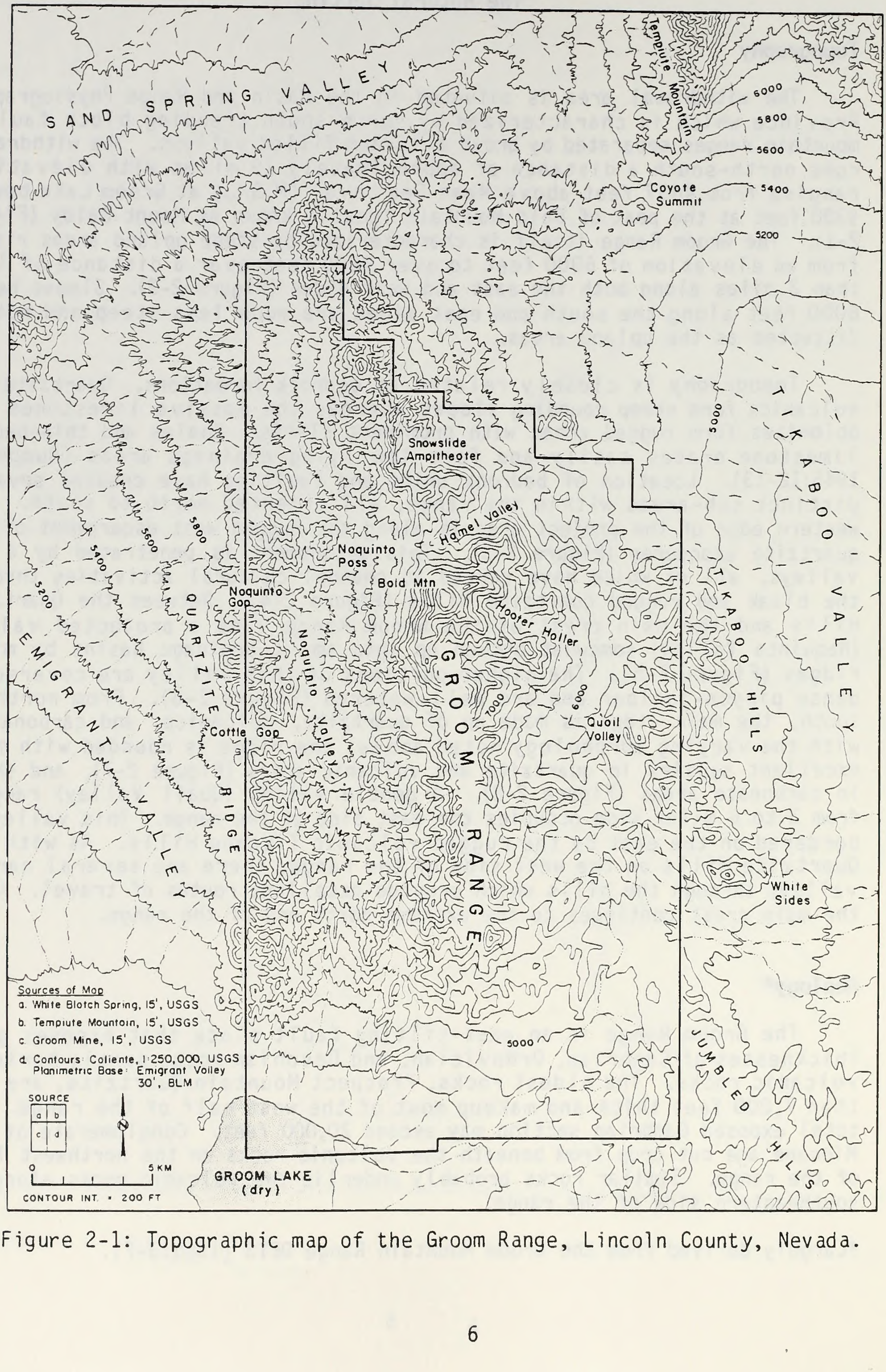

Figure 2-1: Topographic map of the Groom Range, Lincoln County, Nevada.

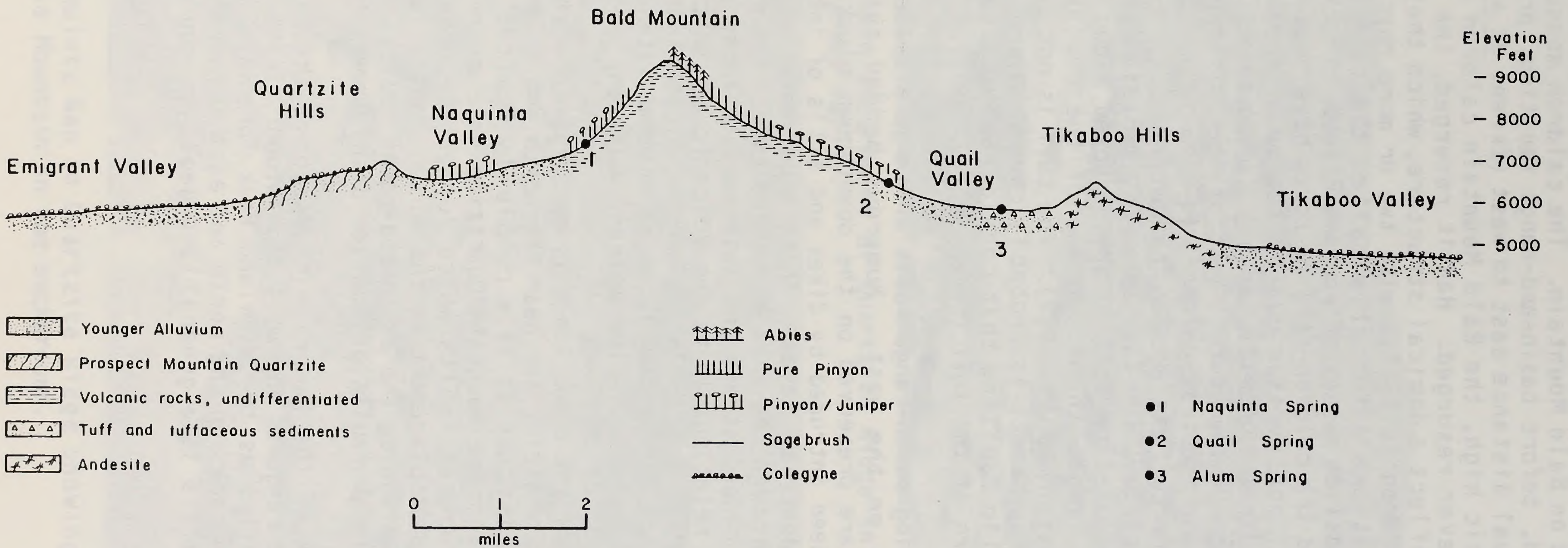

Figure 2-2: Section through the Groom Range, Lincoln County, Nevada. The section is oriented 100^{o} through the summit of Bald Mountain. Springs have been shifted slightly north or south to appear in the section. Please note the vertical exaggeration.

The major volcanic feature of the Groom Range is the Bald Mountain caldron, centered on Bald Mountain. The caldron measures about 6 miles north to south and, before basin-and-range faulting, probably measured an approximately equal distance east to west (Ekren, et al. 1977). Despite being a topographic high, the Bald Mountain caldron probably a simple collapse which never resurged. Had it resurged, the strata within the caldron should reflect a domical structure, which they do not (Ekren, et al. 1977). The caldron is filled with two or more rhyolite ash-flow tuff cooling units that are informally called the tuff of Bald Mountain. Numerous large landslide masses of various Paleozoic rocks are intercalated with the tuffs, and the caldron-filling rocks have been intrude by numerous dikes and sills of porphyritic quartz latite or rhyodacite. The tuffs contain abundant lithic fragments, mostly carbonate but also of quartzite, argillite, and older welded tuff. Most of the tuff exposed in the higher parts of the mountain (central caldron) is rich in pumice fragments (Ekren, et al. 1977). The tuff is mostly hydrothermally altered, and fresh phenocrysts are sparse. The tuff of Bald Mountain has been tentatively correlated with an ash-flow cooling unit exposed along the south flank of the Quinn Canyon Range, the south end of the Pancake Range, and the Reveille Range (Ekren, et al. 1977). The tuff is not present east of the Groom Range and its absence is probably caused by prebasin-range, left-lateral strike-slip faulting that considerably distorted the original distribution pattern of the tuff (Ekren, et al. 1977).

A north-trending basin-range fault of large displacement cuts the Bald Mountain caldron on the west. Numerous bedded tuffs and tuffaceous sedimentary rocks are preserved on the downthrown block west of the fault. These rocks have been intruded by dikes and sills of intermediate rock, and are overlain by identical lavas. These occurrences may indicate that the caldron extends through the area of bedded tuff. The possibility exists, however, that the bedded strata and intermediate rocks predate the caldera and bear no direct relationship to the volcanic-tectonic structure. If this is the case, the dikes and sills probably indicate that the Bald Mountain area was an important center for lavas of intermediate composition prior to its becoming a center for ash-flow volcanism (Ekren, et al. 1977).

The structure of the Groom Range is comparatively simple except locally in the Groom mining district and near the north end of the Cambrian outcrop. The Groom mining district is in a complexly faulted graben where minor thrust plates of Prospect Mountain Quartzite have overridden Pioche Shale, and west-dipping normal faults which formed the graben have offset the thrust faults. The displacement on the normal faults is as much as several thousand feet and antedates the basin-and-range faults. The youngest faults are east-dipping normal faults of smaller displacement (Humphrey 1945).

The structure of the Cambrian rocks above the Pioche Shale in the northern end of the range is not well understood. In the high hills, rocks tentatively identified as the Highland Peak Formation may be thrust over the Upper Cambrian rocks on the north and east and on the Pioche Shale on the south. Figure 2-9 is a generalized geologic map of the withdrawal area.

Figure 2-3: Western escarpment of Quartzite Ridge in the Groom Range from Emigrant Valley.

Figure 2-4: Naquinta Gap in Quartzite Ridge showing stream terrace with Bald Mountain in the background.

Figure 2-5: View west from crest south of Bald Mountain with Emigrant Valley and the Belted Range in the background. Cattle Gap is in the left background.

Figure 2-6: Cliff Spring from the west.

Figure 2-7: Hamel Valley from the east with Bald Mountain and Naquinta Pass in the background.

Figure 2-8: Crest of the Groom Range looking south toward Bald Mountain.

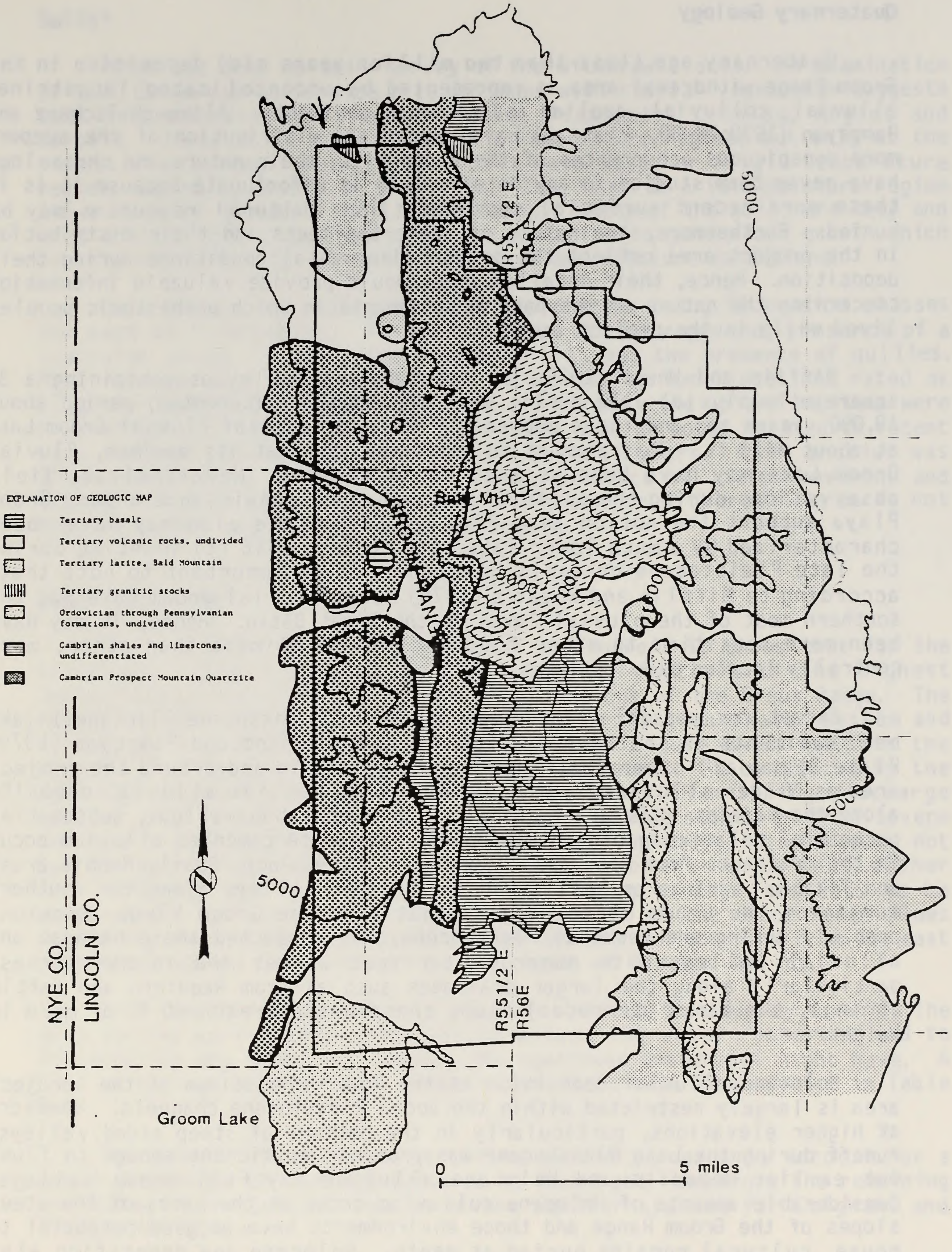

Figure 2-9: Generalized geologic map of the Groom Range, Lincoln County, Nevada.

Quaternary Geology

Quaternary age (less than two million years old) deposition in the Groom Range withdrawal area is represented by unconsolidated lacustrine, alluvial, colluvial, aeolian and residual sediments. Although Tschanz and Pampeyan (1970:78-80, Plate 2) have mapped the distribution of the deeper, more conspicuous occurrences of these deposits, their nature and chronology have never been studied in any detail. This is unfortunate because it is in these more recent surficial sediments that cultural resources may be buried. Furthermore, the nature of these sediments and their distribution in the project area reflect the paleoenvironmental conditions during their deposition. Hence, their detailed study would provide valuable information concerning the nature of the past environments in which prehistoric peoples lived while in the project area.

Mifflin and Wheat (1979:53) list Emigrant Valley as containing a 36 square mile pluvial lake during the Late Wisconsin (Lahontan) period about 18,000 years ago and have mapped the highest level of Pluvial Groom Lake at about 4475 ft. This high stand indicates that, at its maximum, Pluvial Groom Lake may have been as much as 38 ft deep. Nevertheless, field observations during the cultural resources reconnaissance around Groom Playa support the notion that Pluvial Groom Lake also may have been characterized by a much lower lake stand (circa 4446 ft) sometime during the late Pleistocene or early Holocene. It is important to note that, according to Mifflin and Wheat's (1979) data, Pluvial Groom Lake was the southern most of the pluvial lakes in the Great Basin. Hence, it may have been more sensitive to minor fluctuations in climate than other, more centrally located pluvial lakes.

Except for possible "Intermediate (Early Pleistocene/Pliocene?) lake bed" sediments in southern Tikaboo Valley, Tschanz and Pampeyan (1970, Plate 2) map all other Quaternary age deposits in and around the project area as "Older alluvium." In addition to the massive alluvial deposits along the bajadas in Emigrant, Sand Spring and Tikaboo valleys, substantial pockets of relatively old (Pleistocene), carbonate cemented alluvium occur in the drainages from Rose Bud, Naquinta, Cattle, Rock, Quail, Rabbit Brush and Tikaboo springs as well as in the broader valleys along the southern margin of the Groom Range such as that from the Groom Mine. Erosion, probably during the terminal Pleistocene, has dissected these bajadas and alluvial valleys with numerous terraced washes and in many areas, particularly along the larger drainages such as from Naquinta and Cattle springs, the banks (terraces) along these washes reach 40 ft or more in height.

Holocene alluvial deposition at the lower elevations of the project area is largely restricted within the above Pleistocene channels. However, at higher elevations, particularly in the bottoms of steep sided valleys, runoff during the Late Pleistocene was probably sufficient enough to flush out earlier deposits and Holocene alluvium may fill these valleys. Considerable amounts of Holocene colluvium occur at the bases of the steep slopes of the Groom Range and those environments have an good potential to house cultural remains buried at depth. Holocene age deposition also occurs as aeolian dunes and sand sheets to the west and northwest of the Groom Lake playa. The depth of these deposits is unknown but may be substantial in areas marked by breaks in topographic relief.

Soils*

There has been no soil survey of the withdrawal area. An examination of Soil Conservation Service site writeups with similar vegetation suggests that the dominant soils are Orthents, Psamments, Orthids, Argids and Xerolls. These soils may have thermic temperature regimes but only at the lowest elevations. Most of the soils have mesic or frigid temperature regimes depending mostly on elevation. They have an aridic moisture regime and a mixed or montmorillonitic mineralogy. Many of the soils are deep and well drained with clay layers and are conducive to good plant growth which is only restricted by adverse temperature and moisture conditions.

Soil erosion was estimated at 21 field sites using 15 erosion classes for each of 7 variables. These variables are bare ground, presence of a vesicular crust, litter, wind erosion, rills and the presence of gullies. Most ratings were stable with a few categories at some locations rated as slight or moderate relative to erosion. Generally the upland habitats were only slightly eroded. There was some gully erosion noted related to recent heavy storms probably within the past several years. Rill erosion was almost nonexistent. There was also some evidence of litter movement and accumulation on some sites. Overall the entire withdrawal area is not heavily eroded and surface soils are stable.

Water Resources*

The precipitation pattern as shown in Figure 2-10 shows that for the withdrawal area elevation is the principle factor with the highest accumulations occurring at the higher elevations of the Groom Range. The high precipitation areas provide recharge to the groundwater system and serves as a source for the springs shown in Figure 2-11. Within the withdrawal area there exist no perennial streams. As evidenced by the drainage patterns, the only surface flow other than spring discharge results from either intense localized summer thunderstorms or from severe infrequent warm winter storms. This infrequent ephemeral discharge is not put to any direct use in or adjacent to the area with most either infiltrating into channel bottoms or flowing to dry lake beds to be evaporated. Surface drainage from the west side of the Groom Range flows toward dry lake areas in Emigrant Valley and any surface flow from the east side flows toward the southeast to the center of Tikaboo Valley.

Site specific water resource data are limited to a survey taken in the area during spring 1985 which was to assess the water resources and to characterize any potential impacts the continued withdrawal might have. A list of springs together with location and field data is presented in Table 2-1.

The quantities measured as spring discharge can only account for a small percentage of that estimated to be recharged, therefore the remaining estimated recharge contributes to the aquifer systems for Emigrant and Tikaboo Valleys.

*Largely derived from the Groom Mountain Range DEIS (1985:3-9 to 3-12).

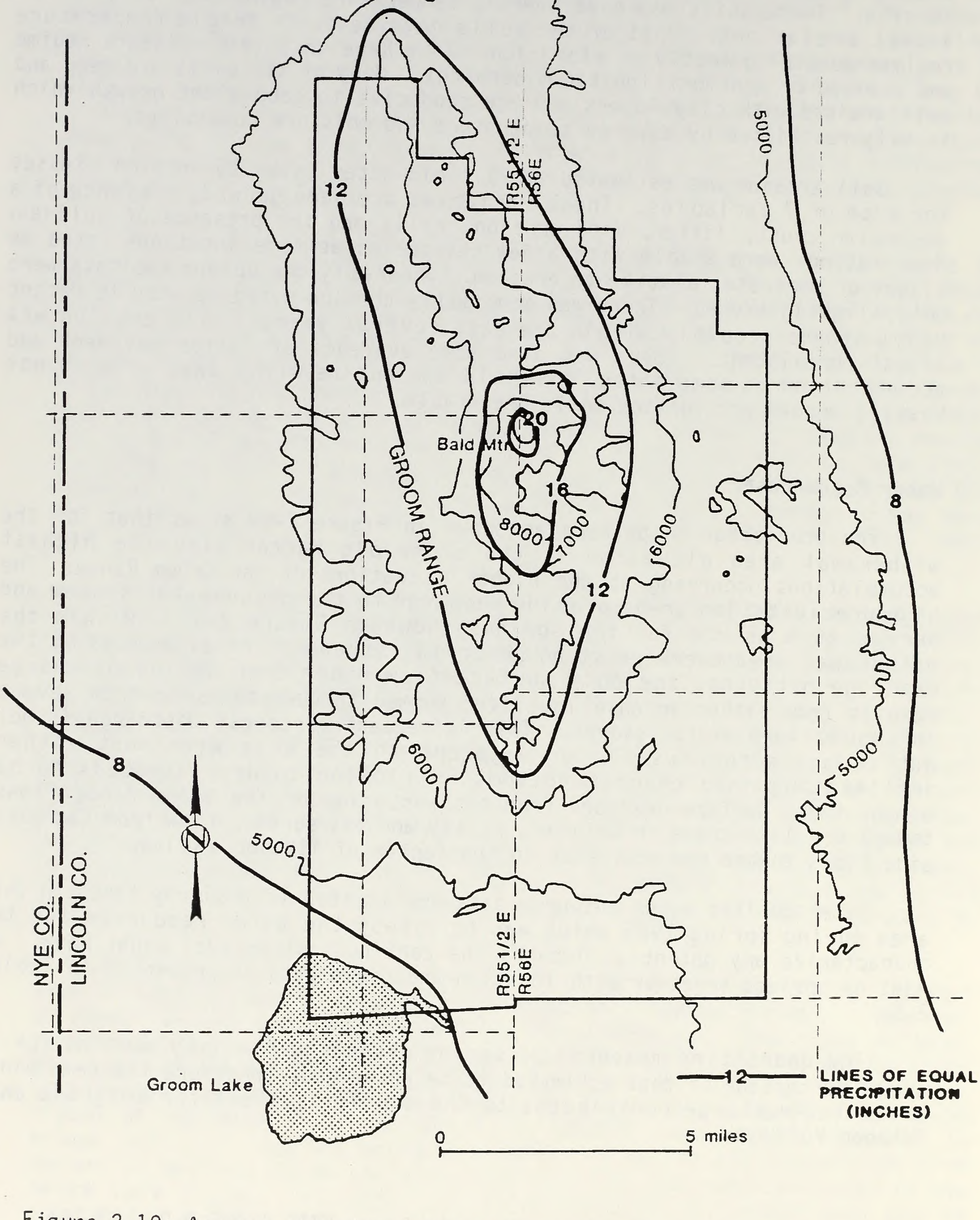

Figure 2-10: Average annual precipitation (after French, 1983).

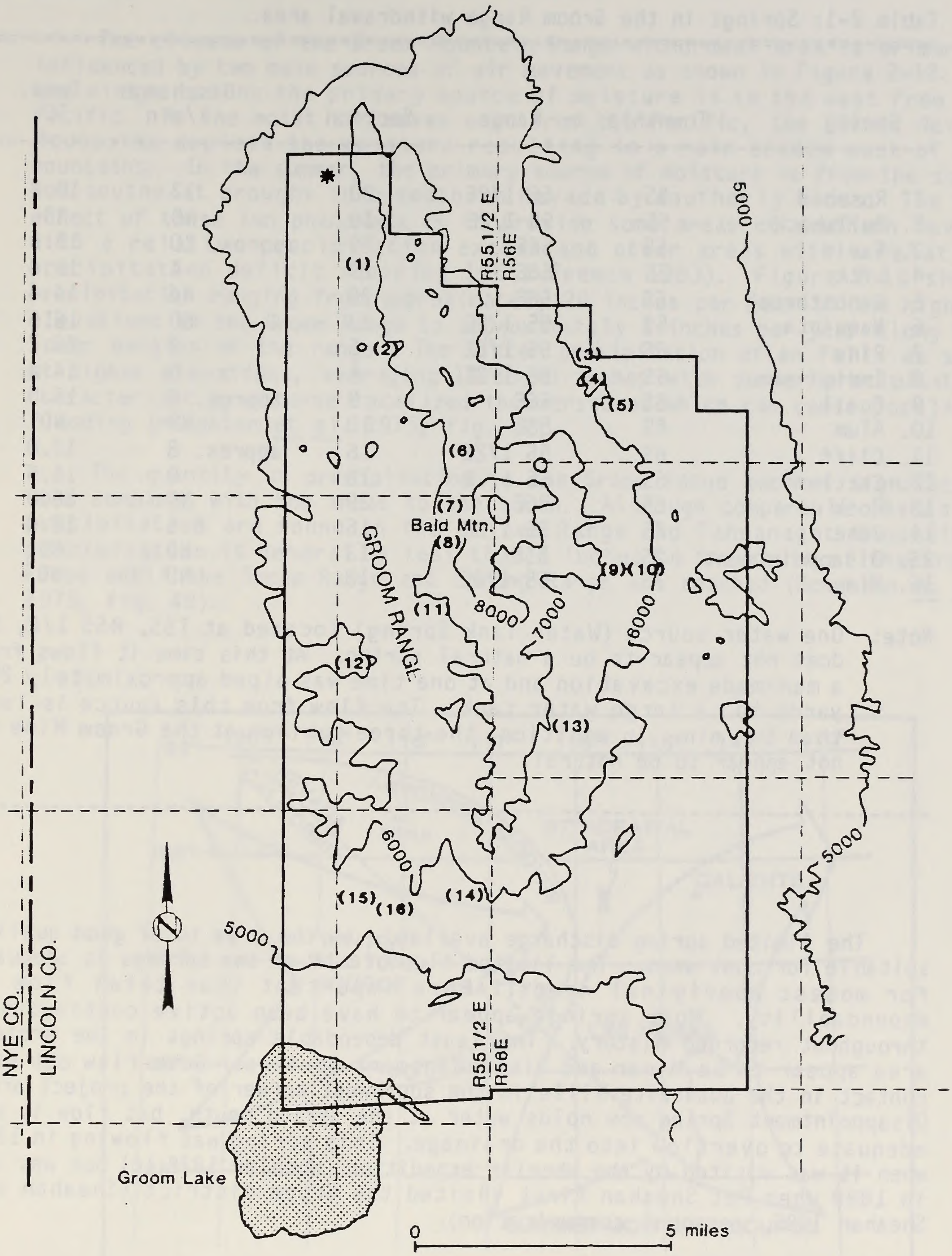

Figure 2-11: Springs in the Groom Range. * = Old Water Tank; (1) = Numbers correspond to Table 2-1.

Table 2-1: Springs in the Groom Range withdrawal area.

Spring	Township	Range	Section	Discharge l/min	Temp. °C
1. Rosebud	5S	55 1/2E	20	12	10.3
2. Bullwhack	5S	55 1/2E	18	ND	ND
3. Savio	5S	56E	29	approx. 20	18.6
4. Lick	5S	56E	29	4	18.4
5. Rabbitbrush	5S	56E	28	46	14.4
6. Naquinta	5S	55 1/2E	33	60	16.5
7. Pine	6S	55 1/2E	5	3	20.2
8. Indian	6S	55 1/2E	8	6	14.4
9. Quail	6S	56E	9	approx. 8	15.0
10. Alum	6S	56E	10	ND	ND
11. Cliff	6S	55 1/2E	16	approx. 8	13.0
12. Cattle	6S	55 1/2E	18	8	16.5
13. Rock	6S	56E	29	ND	16.0
14. Cane	7S	55 1/2E	16	8.5	13.0
15. Disappointment	7S	55E	13	ND	ND
16. Miner	7S	55 1/2E	18	ND	ND

Note: One water source (Water Tank Spring) located at T5S, R55 1/2, S6 does not appear to be a natural spring. At this time it flows from a man-made excavation and at one time was piped approximately 200 yards to a large water tank. The flow from this source is less than 5 l/min. In addition, the three springs at the Groom Mine do not appear to be natural.

The limited spring discharge available in the area is of good quality suitable for most uses. The limited flow of all of the springs is adequate for modest aboriginal needs. More important than total flow is dependability. Most springs appear to have been active continuously throughout recorded history. The least dependable springs in the project area appear to be Miner and Disappointment Springs. Both flow out of a contact in the quartzite hills in the southwest corner of the project area. Disappointment Spring now holds water at the spring mouth, but flow is not adequate to overflow into the drainage. This spring was flowing in 1871 when it was visited by the Wheeler expedition (Wheeler 1872:16) but was dry in 1889 when Pat Sheahan first visited the Groom district (Sheahan and Sheahan 1985, personal communication).

Climate*

The climate of the Groom Mountain Range Withdrawal area is primarily influenced by two main sources of air movement as shown in Figure 2-12. In the winter months the primary source of moisture is to the west from the Pacific. As the moist air moves east from the Pacific, the Sierra Nevada Mountains deplete the moisture resulting in a rain shadow east of the mountains. In the summer, the primary source of moisture is from the south and southeast brought into southern Nevada by southerly winds. The net effect of these two phenomena is to provide some areas of southern Nevada with a relative precipitation excess and other areas with a relative precipitation deficit (Quiring 1965; French 1983). Figure 2-10 shows precipitation ranging from approximately 20 inches per year at the highest elevations in the Groom Range to approximately 8 inches per year along the lower margins of the range. The winter precipitation often falls as snow at higher elevations, averaging 10 to 40 inches with summer precipitation characterized by intense localized thunderstorms which can cause localized flooding (Houghton _et al_. 1975, fig. 52).

The quantity of precipitation in the Groom Range becomes significant when compared with the areas to the south. Although comparable levels of precipitation are found in the Belted Range and Pahranagat Mountains, precipitation is generally less than 8 inches to the south of the Groom Range until the Sheep Range and Spring Range are reached (Houghton _et al_. 1975, fig. 40).

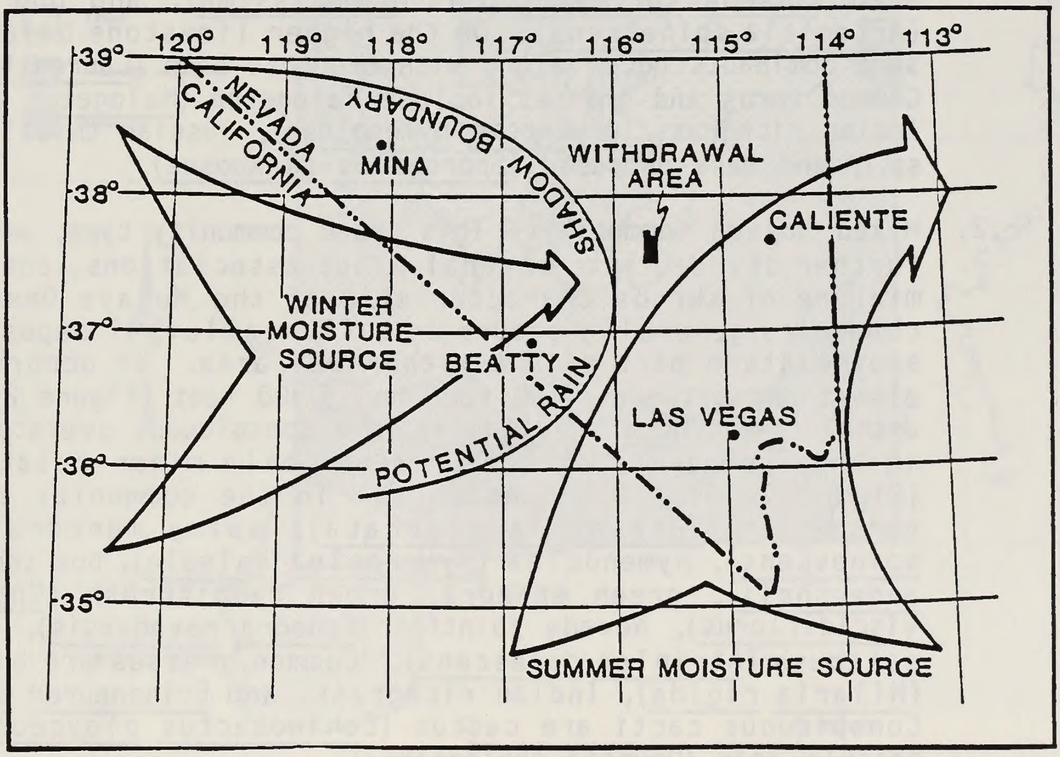

Figure 2-12: Summer and Winter moisture for the Southern Nevada Area (_from_ French 1983).

Daily and seasonal temperature varies greatly within the withdrawal area and is influenced by general air movement and topography. The coldest temperatures occur in January with the highest occurring in July and August. A ten-year summary from the class 1 weather station at Yucca Flat approximately 30 to 40 miles southwest of the area shows extremes from below 0°F occurring in January to in excess of 100°F in July (O'Farrell and Emery 1976, Table 1). Similar temperatures can be expected in the withdrawal area, with colder temperatures at the higher elevations.

Vegetation*

The Groom Range is located near the floristic boundary between the Mojave Desert to the south and the Great Basin Desert to the north. Consequently, floristic elements of both deserts are represented, resulting in a relatively high degree of botanical diversity for such an arid region.

The predominant vegetation community types in the Groom Range withdrawal area are shown in Figure 2-13 and include shrub, woodland, and forest communities. Brief descriptions of major plant communities are given below.

1. Saltbush Community: This community is found at the lowest elevations of the withdrawal area, occurring from 4,500 feet along the margins of Groom Lake to about 5,100 feet on bajadas below the limestone slopes at the southern end of the Groom Range. Dominant shrub species on the Groom Lake shoreline include shadscale (Atriplex confertifolia), green ephedra (Ephedra viridis), seep weed (Suaeda torreyana var. ramosissima), and bud sagebrush (Artemisia spinescens). On the higher limestone bajadas, these same dominants occur along with creosote bush (Larrea tridentata). Common forbs and grasses include halogeton (Halogeton glomerata), Indian ricegrass (Oryzopsis hymenoides), russian thistle (Salsola sp.), and mesa dropseed (Sporobolus flexuosus).

2. Mixed Mojave Community: This broad community type, which may be further divided into several plant associations, consists of a mixture of shrubs characteristic of the Mojave Desert. This community generally occurs on tuff or alluvial deposits in the southeastern part of the withdrawal area. It occurs at lower elevations between 4,500 feet and 5,300 feet (Figure 2-14, 2-15). Joshua tree (Yucca brevifolia) is a conspicuous overstory species in this community, but represents only minor relative cover (Figure 2-16). Dominant shrubs in the community are smooth horsebrush (Tetradymia glabrata), spiny menodra (Mendora spinescens), hymenoclea (Hymenoclea salsola), box thorn (Lycium andersonii), green ephedra, green rabbitbrush (Chysothamnus viscidiflorus), Nevada jointfir (Ephedra nevadensis), and 4-wing saltbush (Atriplex canescens). Common grasses are big galleta (Hilaria rigida), Indian ricegrass, and Erinoneuron pulchellum. Conspicuous cacti are cactus (Echinocactus ploycephalus) and prickly pear (Opuntia echinocarpa).

*Largely derived from the Groom Mountain Range DEIS (1985:3-1 and 3-14 to3-18).

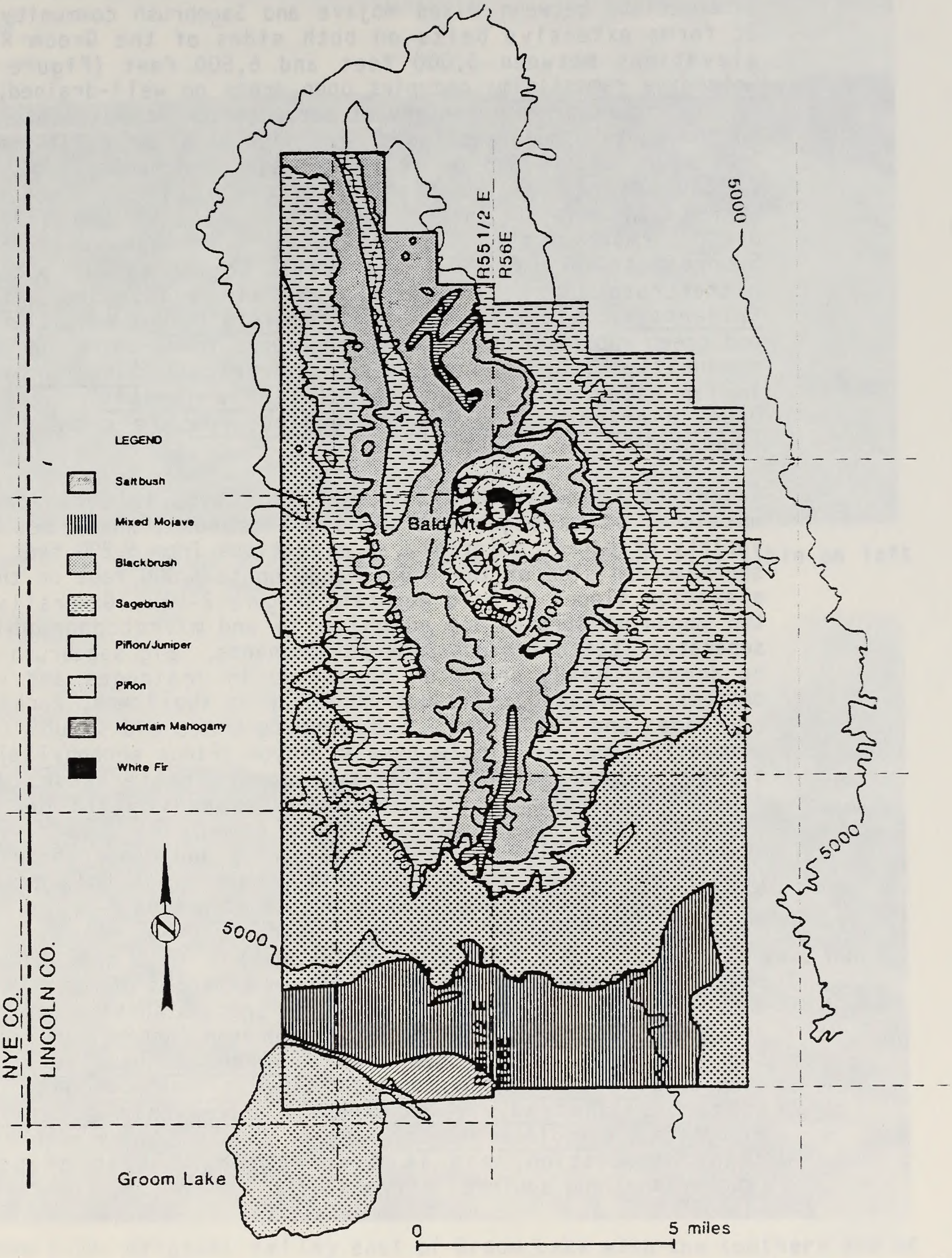

Figure 2-13: Dominant vegetation communities in the Groom Range, Lincoln County, Nevada.

3. Blackbrush Community: The blackbrush (Coleogyne ramosissima) community type is found in habitats and at elevations which are intermediate between Mixed Mojave and Sagebrush community types. It forms extensive belts on both sides of the Groom Range a elevations between 5,000 feet and 6,500 feet (Figure 2-17). Coleogyne ramosissima occupies open areas on well-drained, stony soils derived from a variety of rock types. At lower elevations in the southwestern section of the withdrawal area, it dominates the upper bajadas above the Mixed Mojave community type (Figure 2-18). At higher elevations in the southern part of the withdrawal area, it interfaces with Sagebrush communities, but often forms pure stands on drier south- or west-facing slopes. Subordinate shrubs in the Blackbrush Community include desert bitterbrush (Purshia glandulosa), big sagebrush (Artemisia tridentata), black sagebrush (Artemisia nova), Nevada jointfir, and green rabbitbrush. Grass cover tends to be quite low in this community, with dominants being squirreltail (Sitanian hystrix), Indian ricegrass, and galleta (Hilaria jamesii). The cacti Opuntia erinacea and Opuntia echinocarpa are common in this vegetation type.

4. Sagebrush Community: This vegetation type is dominated by a mosaic of black sagebrush and big sagebrush, which occur on a variety of parent materials at elevations from 5,200 feet on the southeastern side of the Groom Range up to 6,800 feet on the mid-elevation slopes of Bald Mountain (Figure 2-19). Generally these two sagebrush species are edaphically and microtopographically separated, but often occur as co-dominants. Big sagebrush occurs on deeper, sandy soils on mesas and in drainages and valley bottoms, whereas black sagebrush occupies shallower, rocky soils of ridges and hillsides. Subordinate trees and shrubs in this community type are single needle pinyon (Pinus monophylla), Utah juniper (Juniperus osteosperma), desert bitterbrush, Nevada jointfir, green ephedra, and cliffrose (Cowania mexicana). Representative grasses of this community type include squirreltail, galleta, Indian ricegrass, and desert needlegrass (Stipa speciosa). The major cacti occurring in this community type are Opuntia erinacea and Opuntia echinocarpa.

   A distinct plant association within this community type occurs on the volcanic summit and summit ridges of Bald Mountain above 9,000 feet elevations. Dominant species in this association are black sagebrush, mountain big sagebrush (Artemisia tridentata ssp. vaseyana), green rabbitbrush (Chrysothamnus viscidiflorus var. viscidiflorus), wormwood (Artemisia dracunculus), gray horsebrush (Tetradymia canescens), Paronychia jamesii, and whitesage (Ceratoides lanata). Grass cover is very high in this plant association, and is dominated by mutton grass (Poa fendleriana) and squirreltail.

Figure 2-14: Emigrant Valley east of Groom Lake, which is visible on left half of photograph.

Figure 2-15: Emigrant Valley east of Groom Lake with the southern end of the Groom Range in the background.

Figure 2-16: Joshua tree forest at the southern end of the Groom Range area sample quadrat 70.

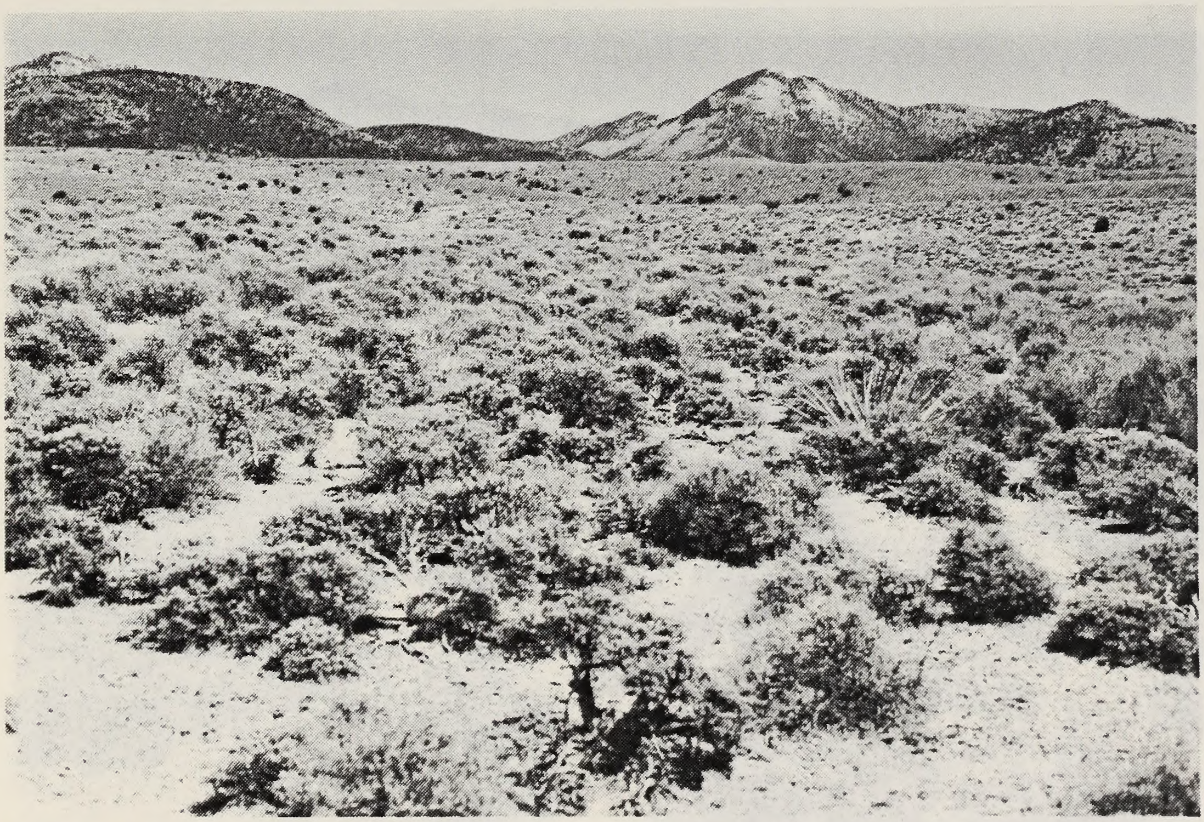

Figure 2-17: Bajada at the northwest side of the Groom Range with Bald Mountain in the background.

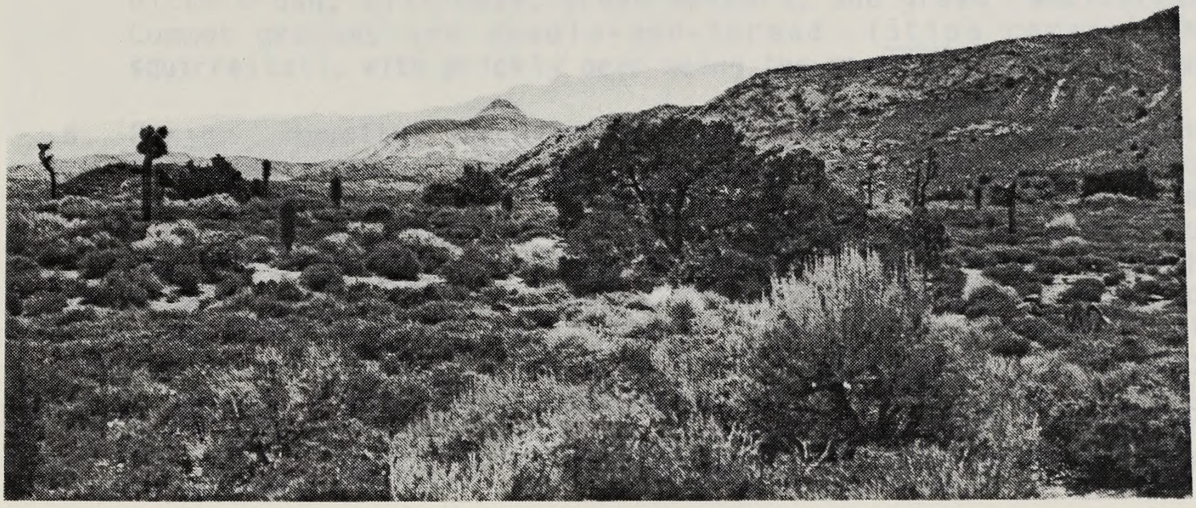

Figure 2-18: Whitesides in center of photograph from vicinity of sample quadrat 54. The Pahranagat Range is in the background.

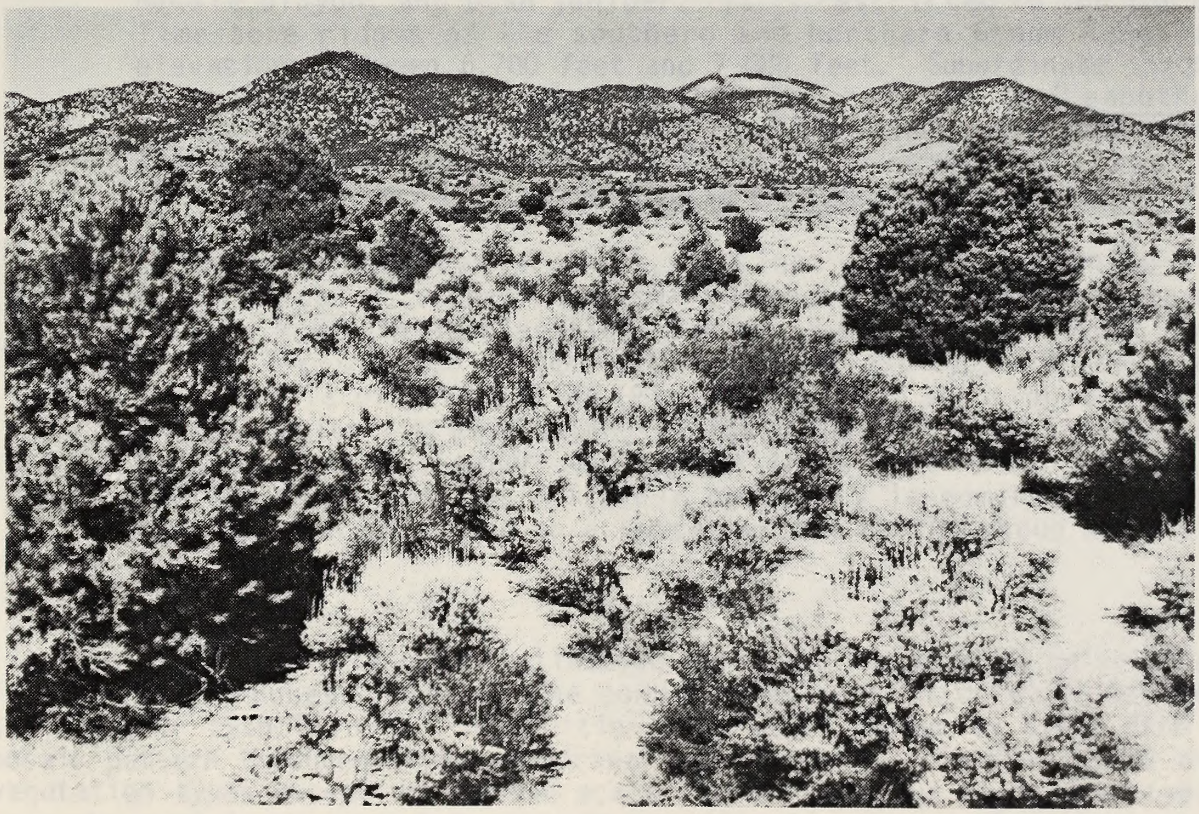

Figure 2-19: Area near Alum Spring with Bald Mountain in the background.

5. Pinyon-Juniper Community: Single needle pinyon and Utah juniper become dominant constituents with sagebrush at about 6,200 feet, particularly along drainages and on north-facing slopes (Figure 2-20). They continue to form discontinuous stands up to about 7,800 feet, forming a vegetation belt at these elevations around most of the Groom Range, particularly on limestone slopes in the northern and southern parts of the range. Understory shrubs in this community are black sagebrush, big sagebrush, desert bitterbrush, cliffrose, green ephedra, and green rabbitbrush. Common grasses are needle-and-thread (_Stipa comata_) and squirreltail, with prickly pear being the most conspicuous cactus.

6. Pinyon Community: Single needle pinyon occupies discontinuous pure stands above 6,300 feet, forming a fairly continuous forest on the slopes of Bald Mountain at elevations between 7,600 feet and 8,600 feet. The Pinyon community type is found primarily on mesic, rocky volcanic substrates, and so occurs primarily in the central Groom Range, whereas Pinyon-Juniper types occur on limestone to the north and south. Understory shrubs in this community type are the same as in the Pinyon-Juniper community, although current (_Ribes velutinum_) and Gambell's oak (_Quercus gambellii_) are also found as localized co-dominants. The dominant grass is mutton grass, and the prickley pear is found in scattered locations.

7. Mountain Mahogany Community: This community type is a distinct association of mountain mahogany (_Cercocarpus ledifolius_), single needle pinyon, and Utah juniper. It is restricted to the top of limestone ridges of the southern and northern Groom Range at elevations between 6,700 feet and 7,800 feet. Subordinate shrubs in this community type are cliffrose, back brush (_Ceanothus greggii_), _Forsellesia nevadensis_, black sagebrush, and green ephedra. The dominant grass in this community type is squirreltail, and the cactus _Opuntia erinacea_ occurs occasionally.

8. White Fir Community: A small, distinct community of white fir (_Abies concolor_) occurs on north- and east-facing volcanic slopes of Bald Mountain at elevations between 8,600 feet and 9,100 feet (Figure 2-21). Also present within this forest type are scattered individuals of limber pine (_Pinus flexilis_) and single needle pinyon. White fir also extends below 8,600 feet on the ridges of Bald Mountain as a minor component of the pinyon forest community. The understory of the White Fir community is dominated by the grass mutton grass and to a lesser extent by the shrub mountain big sagebrush.

The eight community types delineated above are necessarily quite broad for mapping purposes. Most of the communities consist of well defined subgroups or associations. In addition, the major community types form a mosaic pattern throughout the withdrawal area, making it difficult to map vegetation types except on a broad scale. Thus, numerous vegetation types were observed in the area but were not specifically mapped. Detailed notes on local vegetation were collected from sample quadrats and archaeological sites. For example, riparian corridors of _Quercus gambellii_ and _Salix_ sp.

occur in the major drainages of Bald Mountain. Small, disturbed wetland areas occur adjacent to the numerous springs scattered throughout the Groom Range. Although spikerush (Eleocharis) and other aquatic plants occur at these sites, the spring areas tend to be dominated by native species indicative of disturbances, primarily rabbitbrush (Chrysothamnus spp.) stands.

Animals*

Table 2-2 lists the predominant vertebrate species found within the withdrawal area. These species are placed in the major vegetative communities as presented earlier, in Figure 2-13.

The abundance and distribution of these predominant vertebrate species varies greatly, primarily due to the extent and condition of each species prime habitat. The field observation period, Spring 1985, appears to have been exceptionally good for most species. Reptile sightings were numerous. Bird numbers and diversity were high with breeding related activities the rule. Tracks and other signs of nocturnal animals were abundant. Jackrabbit and cottontail numbers were very high, possibly at the peak of a cycle. Coyote sign was very common and frequent sightings were reported. Badger and kit fox sightings were common. Two reports of mountain lion were made in late winter and mountain lion sign was seen by one study crew.

Chukar partridge numbers have been increasing in recent years and the Nevada Department of Wildlife considers the Groom Range to have the best chukar population in Lincoln County (Bechstrand 1985). Gambel quail have been reported on the west side of the range but their numbers do not appear to be high.

Mule deer are widespread throughout the range. Deer and/or fresh deer signs were observed from the highest to the lower part of the range. Recent observations indicate much of the range is deer habitat with a herd size probably approaching 300 animals. Winter sightings are reported (Sheahan and Sheahan 1985) which indicate the possibility of a migration route between the Groom Range and the Cactus Hills and the Belted Range. Domestic livestock graze the entire range and also use the primary forage species for deer. Many of the areas near springs are severely grazed by livestock to the detriment of deer forage and deer.

There have been no recent sightings of wild horses in the area. Two burros were frequently seen a number of years ago, but only one burro has been seen in the last two years and he was not seen this last spring.

There are no bighorn sheep in the Groom Range, although in the 1930's one bighorn sheep skull was found near Indian Springs and one at Groom Lake. There are reports of bighorn sheep using Summit Spring, about five miles southeast of the withdrawal boundary. Several antelope were seen near the western border of the withdrawal area.

*Largely derived from the Groom Mountain Range DEIS (1985:3-21 to 3-25).

Figure 2-20: Naquinta Spring from the flanks of Bald Mountain.

Figure 2-21: North end of the Groom Range looking across Hamel Valley from Bald Mountain.

Table 2-2: Predominant animal species expected in the Groom Range.

Predominant Species	Vegetative Communities: Saltbush	Mixed Mojave and/or Black Brush	Sagebrush	Pinyon Juniper and/or Higher Elevation Communities
AMPHIBIANS				
Great basin spadefoot toad (*Scaphiopus intermountainus*)				X
Western toad (*Bufo boreas*)		X	X	X
REPTILES				
Lizards				
Zebra tailed lizard (*Callisauras draconodes*)	X	X	X	
Desert collared lizard (*Crotophytus isularis*)	X	X	X	
Desert horned lizard (*Phrynosoma phatyrhinos*)	X	X	X	
Sagebrush lizard (*Sceloperous graciosus*)	X		X	X
Western fence lizard (*Sceloperous occidentalis*)	X	X	X	X
Side blotched lizard (*Uta stansburiana*)	X	X	X	X
Western whiptailed lizard (*Cnemodophorus tigris*)	X	X	X	X
Snakes				
Coachwhip - red racer (*Masticophis flagellum*)	X	X		
Striped whipsnake (*Masticophis taeniatus*)		X	X	X
Great basin gopher snake (*Pituophis melanoleucus*)	X	X	X	X
Western patch-nosed snake (*Salvadora hexalepis*)	X	X	X	
Sidewinder (*Crotalus cerastes*)	X	X		
Western rattlesnake (*Crotalus viridis*)	X	X	X	X
BIRDS				
Sage sparrow (*Amphispiza billi*)	X	X	X	
Black-throated sparrow (*Amphispiza bilineata*)	X	X	X	X
House finch (*Carpodacus mexicanus*)	X	X	X	X
Bush tit (*Psaltriparus minimus*)				X
Cliff swallow (*Petrochelidon pyrrhonota*)	X	X	X	X
Ash-throated fly catcher (*Myiarchus cinerascens*)	X	X		
Western meadowlark (*Sturnella neglecta*)	X		X	X
Horned lark (*Eremophila alpestris*)	X	X	X	X
Loggerhead shrike (*Lanius ludovicianus*)	X	X	X	
Western kingbird (*Tyrannus verticularis*)	X	X	X	X

Table 2-2: Predominant animal species expected in the Groom Range (cont'd).

Predominant Species	Vegetative Communities: Salt Bush	Mixed Mojave and/or Black Brush	Sagebrush	Pinyon Juniper and/or Higher Elevation Communities
Common flicker (*Colaptes auratus*)		X	X	X
Brown headed cowbird (*Molothrus ater*)			X	X
Rufous-sided towhee (*Pipilo erythrophthalmus*)			X	X
Pinyon jay (*Gymnorphinus cyanocephalus*)			X	X
Gambel's quail (*Lophortyx gambeli*)		X	X	
Chukar partridge (*Alectoris graces*)		X	X	X
Mourning dove (*Zenaida macroura*)	X	X	X	X
Common raven (*Corvus corax*)	X	X	X	X
Sharp-shinned hawk (*Accipiter striatus*)	X	X	X	X
Cooper's hawk (*Accipiter cooperii*)	X	X	X	X
Red-tailed hawk (*Buteo jamaicensis*)	X	X	X	X
Golden eagle (*Aquila chrysaetos*)	X	X	X	X
Turkey vulture (*Cathartes aura*)	X	X	X	X
Great horned owl (*Bubo virginianus*)	X	X	X	X
MAMMALS				
Shrews				
Merriam's shrew (*Sorex merriami*)		X	X	X
Bats				
Little brown myotis (*Myotis lucifugus*)		X	X	X
Big brown bat (*Eptesicus fuscus*)	X	X	X	X
Townsend's big-eared bat (*Plecotus townsendii*)				X
Brazilian free-tailed bat (*Tadaria braziliensis*)	X	X	X	X
Rabbits and Hares				
Desert cottontail (*Sylvalagus andubonii*)	X	X	X	
Black-tailed jackrabbit (*Lepus californicus*)	X	X	X	X
Rodents				
White-tailed antelope ground squirrel (*Ammospermophilus leucurus*)	X	X	X	
Townsend's ground squirrel (*Spermophilus townsendii*)			X	X
Botta's pocket gopher (*Thomomys bottae*)	X	X	X	X
Great basin pocket mouse (*Perognathus parvus*)			X	X
Dark kangaroo mouse (*Macrodipodops megacephalus*)	X	X		

Table 2-2: (cont'd)

Predominant Species	Vegetative Communities: Salt Bush	Mixed Mojave and/or Black Brush	Sagebrush	Pinyon Juniper and/or Higher Elevation Communities
Pale kangaroo mouse (Macrodipodops pallidus)	X	X		
Ord's kangaroo rat (Dipodomys ordii)	X		X	
Chisel-toothed kangaroo rat (Dipodomys microps)	X		X	X
Merriam's kangaroo rat (Dipodomys merriamii)	X	X	X	
Harvest mouse (Reithrodontomys megalotus)	X	X	X	
Deer mouse (Peromyscus maniculatus)	X	X	X	X
Pinyon mouse (Peromyscus truii)				X
Desert wood rat (Neotoma lepida)			X	X
Sagebrush vole (Lagurus curtatus)			X	
CARNIVORS				
Coyote (Canis latrans)	X	X	X	X
Kit fox (Vulpes macrotis)	X	X	X	
Badger (Taxidae taxus)	X	X	X	X
Striped skunk (Mephitis mephitis)	X	X	X	X
Bob cat (Lynx rufus)	X	X	X	X
Mountain lion (Felis concolor)	X	X	X	X
Hoofed Mammals				
Mule deer (Odocoileus hemonianus)	X	X	X	X
Pronghorn antelope (Antilocapra americana)	X	X	X	

Paleoenvironments by L.C. Pippin

Using evidence from packrat middens found at various localities on and around the Nevada Test Site, Spaulding (1983a) has postulated that major changes have occurred in the climate of the Nevada Test Site during the last 45,000 years. He hypothesizes that 45,000 years ago average annual temperatures were at least 2° C lower than today and winter precipitation exceeded current values by as much as 20 percent. By about 18,000 years ago, during maximum glacial conditions, average summer temperatures are reconstructed to have been 6° to 8° C less than those of today and average annual precipitation is said to have exceeded present quantities by about 30 to 40 percent. According to Spaulding (1983a), postglacial warming probably began shortly thereafter and by about 9,000 to 10,000 years ago average annual temperatures and precipitation are said to have approached present values. Spaulding's (1983a) reconstructions for full-glacial climate are intermediate between previous scenarios that envision a slightly more moist and less cold pluvial climate (Antevs 1952; Broecker and Orr 1958; Mifflin and Wheat 1979; Snyder and Langbein 1962; Van Devender 1973) and those that postulate a drier and colder late glacial maximum (Brackenridge 1978; Dohrenwend 1984).

LaMarche's (1973, 1974) studies of changes in treeline on the White Mountains of eastern California and southwestern Nevada has provided a good record of fluctuations in temperatures of southern Nevada during the last 6000 years; a time period poorly represented in Spaulding's (1983a) packrat midden record. Although adequate precipitation is probably the most important aspect in the elevation of lower treeline, the position of upper treeline in this and other high mountain ranges appears to be most closely related to warm-season temperatures (LaMarche 1973:647-652). Tree-ring dated remains of bristlecone pine (Pinus longaeva) now growing above present treeline in the White Mountains indicate that between 6000 and 4000 years ago summer temperatures may have been as much as 2° C higher than today's. Summer cooling, resulting in a lowering of treeline, apparently began about 3500 years ago and lasted until about 2500 years ago. This was followed by a period of continued cool temperatures, but apparently drier conditions as evidenced from fluctuations in lower treeline. Another major drop in tree line, probably reflecting the onset of cold and dry conditions during the Neoglacial, occurred between about 800 to 400 years ago. Finally, the well documented mid-19th Century warming trend (Brinkmann 1976; Mitchell 1961:247-149, figs. 1,2,4; Reitan 1974) was reflected by high reproduction rates of bristlecone pines and the establishment of scattered seedlings at higher elevations during the past 100 years (LaMarche 1973:653-658; 1974, fig. 5).

Although still immature, our knowledge of vegetation change near the Groom Range during the terminal Pleistocene and Holocene epochs has increased dramatically with the development of packrat midden studies in the surrounding region (Baker 1983:121-123; Martin and Mehringer 1965; Mehringer 1977; Spaulding, Leopold and Van Devender 1983; Van Devender and Spaulding 1979). Early records of fossil pollen from Searles Lake, California (Leopold 1967, 1970; Roosma 1958), and Tule Springs, Nevada (Mehringer 1967), were interpreted to reflect a considerable expansion of woodlands across the Mojave Desert during the Wisconsin glacial maximum about 18,000 years ago. Mehringer (1967:189-192, fig. 38) postulated that a marked change from juniper-sagebrush to sagebrush-shadscale vegetation occurred about 12,000 years ago in the Las Vegas Valley.

This reconstruction of terminal Pleistocene vegetation in the vicinity of the Groom Range is apparently confirmed by dated packrat middens from Owl Canyon near Ash Meadows (Mehringer and Warren 1976:125) and from mountains around Frenchman Flat (Wells and Jorgensen 1964, Table 1). These middens, now situated in areas inhabited by Mojave Desert shrubs (Larrea tridentata and Ambrosia dumosa), contained abundant remains of juniper (Juniperus osteosperma). In fact, until recently, most glacial-age macrofossil records from the Mojave Desert contained evidence of woodlands at lower elevations (Spaulding, Leopold and Van Devender 1983; Van Devender and Spaulding 1979). Nevertheless, the middens also indicate that these woodlands differed considerably from present woodland plant associations (Spaulding, Leopold and Van Devender 1983:273-276, fig. 14.7, Table 14.3). Hence, while some species such as juniper occurred more than 1000 m below their current limits, others were displaced less than 400 m or so and some, such as shadscale (Atriplex confertifolia) actually occurred much higher in elevation than they do today. Furthermore, Spaulding (1983a) has reported the existence of several Late Wisconsin packrat middens from the Specter Range that completely lack woodland conifers, and rather, contain abundant macrofossils of desert shrubs and succulents such as woolly scale-broom (Lepidospartum latisquamum), prickly pear (Opuntia sp.), matchweed (Gutierrezia microcephalla), desert almond (Prunus fasciculata), barrel cactus (Echinocactus polycephalus), horsebrush (Tetradymia cf. glabrata), twinfruit (Menodora spinescens), and Joshua tree (Yucca brevifolia) as well as shadscale. However, there is no evidence of frost sensitive desert plants such as creosote bush, desert spruce (Peucephyllum schottii) or bursage and Spaulding (1983a) infers that a regional vegetation mosaic of cold desert shrub and woodland inhabited elevations below 3300 ft (1000 m) in the Mojave Desert during the last part of the Late Wisconsin.

This generalization provides a picture of what vegetation resources might have been at the lower elevations on the Groom Range at the time of man's first arrival in this region 11,000 to 12,000 years ago or so, but it does not provide a picture of the vegetation at higher elevations nor the changes they underwent during the later Holocene. Late Pleistocene packrat middens situated at 5900 ft (1810 m) in the volcanic Eleana Range west of Yucca Flat, contain abundant quantities of pinyon and juniper along with mountain mahogany (Cercocarpus ledifolius), snowberry (Symphoricarpos sp.), sagebrush (Artemisia sec. Tridentata), bitterbrush (Purshia tridentata), desert sage (Salvia dorrii), prickly phlox (Leptodactylon pungens) and other woodland associates (Spaulding 1983b:90-91, Table 23). Limber pine (Pinus flexilis) is present in middens dating 15,900 years ago, but is absent in younger middens and Spaulding (1983b:109) believes that the Eleana Range locality was near the upper limit of a late Wisconsin pygmy-conifer woodlands. The lower elevations of the Groom Range probably also supported a pygmy-conifer woodland and at the time of man's first arrival in this area. Evidence from the Horse Thief Hills and Eureka View packrat middens in Eureka Valley (Spaulding 1980:35-38, Tables 5,6) indicate that the lower limits of this woodland might have reached down to 5000 ft (1615 m) or lower, but this border was probably quite variable depending on exposure, substrate, topographic position, etc.

A subalpine forest might have covered the upper elevations of the Groom Range during the terminal Pleistocene. Limber pine was the dominant macrofossil in all of Spaulding's (1981, Table 38) Ice Age middens between 1860 and 2040 meters (6100 and 6690 ft) in the Sheep Range and bristlecone pine (Pinus longaeva) occurred with limber pine between 2040 and 2400 meters (6690 to 7870 ft) in elevation. Consequently, during glacial maximum conditions these tree species might have also occupied portions of Pahute and Rainier mesas, but by 11,000 years ago or so limber pine had retreated to above 2380 meters (7800 ft) in the Sheep Range (Spaulding 1981:192). Spaulding (1981:192) notes that the absence of a Wisconsin-age fir-pine forest on the Sheep Range is perplexing. Mehringer and Ferguson (1969:284-287) recorded the presence of white fir (Abies concolor) in a 12,000 year old packrat midden at an elevation of 1910 meters (6265 ft) in the Clark Mountains south of the Nevada Test Site and, today, white fir grows with both pinyon (lower elevational limit) and limber pine (upper elevational limit) between 2620 and 2770 meters (8600 and 9100 ft) on the Groom Range.

Evidence for the establishment of and fluctuations in Holocene vegetation in the Groom Range is also extremely limited. Packrat middens, dating between 8300 and 7900 years ago, are reported from the Sheep Range, situated over 100 km east of the study area, from the Marble Mountains, over 200 km south of the Groom Range, and from northern Eureka Valley, located 130 km northwest of The Groom Range. The Penthouse 1 midden in the Sheep Range, dated at 8100 B.P., was dominated by plants currently inhabiting this site and, except for a few surviving junipers, lacked the woodland mesophytes that characterized that area during the Late Wisconsin (Spaulding 1981:98-103, 192, Table 14). Similarly, packrat middens in the Marble Mountains and in northern Eureka Valley, dated at 7930 B.P. and 8330 B. P. respectively, also were characterized by flora currently growing at those sites (Spaulding 1980:34, Tables 4a, 9). Consequently, except for a few extra locals, vegetation was probably reaching its present composition and zonation by about 8000 years ago. However, although creosote bush was probably near its current distribution by this time, bursage, the other major component of today's Mojave Desert, probably did not reach its current distribution until about 6000 or 7000 years ago (Spaulding 1980:43-47). Likewise, there is evidence for minor fluctuations in vegetation composition during the middle Holocene. Two packrat middens, situated in current desert vegetation about 150 m below the present woodland boundary in the Sheep Range, contained the remains of pinyon and juniper and were dated at 5210 B.P. (the Desert View Site) and 3520 B.P. (the Basin Wash Site). Spaulding (1981:209; 1983b:120) uses this evidence to postulate increased effective moisture during the middle Holocene.

Prehistory

by L.C. Pippin

The written prehistory of southern Nevada and adjacent California is marked by a profusion of "cultures," "industries," "phases," "traditions," and "periods" (Warren 1967:169-72; Warren and Crabtree 1972). This chaotic state of culture definition and sequence construction reflects a scarcity of absolute dating and an emphasis on establishing localized chronologies. Several of these chronologies are presented in Figure 2-22.

Years B.P.	Nevada Test Site Worman 1969, Rogers 1966	Death Valley Wallace & Wallace 1978	Death Valley Hunt 1960	SW Great Basin Warren 1980	SW Great Basin Bettinger & Taylor 1974	SW Great Basin Hester 1973	Southern Nevada Shutler 1967	Southern Nevada Hauck et al. 1979	Central Nevada Thomas 1971, 1983
			Death Valley IV	Shoshonean Period	Marana Period	Late Prehistoric		Protohistoric	
	Paiute						Mesa House Lost City	Mesa House Lost City	Yankee Blade
	Pueblo/Anasazi	Panamint Culture	Death Valley III	Saratoga Springs Period	Haiwee Period	Rose Spring/ Eastgate			
1,000 --	Basketmaker	Saratoga Springs Culture					Muddy River	Muddy River	Underdown
2,000 --					Newberry Period		Moapa	Moapa	
3,000 --	Amargosa III		Death Valley II	Gypsum Period		Great Basin Archaic	Pinto-Gypsum Phase		Reveille
4,000 --		Mesquite Flat Culture			Little Lake Period		Corn Creek Dune Phase	Little Lake Pinto-Gypsum	Devil's Gate
5,000 --	Amargosa II (Pinto-Gypsum)								Clipper Gap
6,000 --	Amargosa I	Hiatus		Pinto Period					
7,000 --					?	Haitus	Haitus	Haitus	
8,000 --	San Dieguito III San Dieguito II	Nevares Spring Culture							
9,000 --				Lake Mojave Period	Mojave Period	Western Pluvial Lakes Tradition		San Dieguito Haitus	
10,000 --		Unoccupied	Death Valley I						
11,000 --							Las Vegas Phase	Tule Springs	
12,000 --	San Dieguito I Clovis			Pleistocene		Fluted Point Tradition	Tule Springs Phase		

Figure 2-22: Various cultural chronologies proposed for the prehistory of southern Nevada and adjacent California.

Little research has been conducted concerning the specifics of how past human populations adapted to the varied environments of the southern Great Basin or how those adaptations might have changed through time (Lyneis 1982:175; Warren 1980:23-54). Early scholars often speculated as to the nature of subsistence strategies and postulated correlations between changes in those strategies and fluctuations in climate, but little empirical evidence or cohesive theoretical models concerning adaptive strategies have been produced to support such speculations.

Pleistocene Big Game Hunters

Evidence of a society that may have hunted the extinct megafauna at the end of the Pleistocene using fluted projectile points is accumulating throughout Nevada (Tuohy 1985:16-17), which until recently was a gap in the distribution of remains from the Fluting Co-tradition (Davis and Shutler 1969:156). In addition to fluted points, this tradition is characterized by a preference for heat treated cryptocrystalline toolstone, gravers, borers, and a variety of scrapers. (Amsden 1937:85-88; Davis and Shutler 1969; Campbell and Campbell 1940; Perkins 1967; Shutler and Shutler 1959; Tuohy 1968, 1969, 1974). Tuohy (1974) has suggested the term "Western Clovis Tradition" for these cultural assemblages; whereas Hester (1973:61-62) uses the term "Fluted Point Tradition." However, Wilke, King and Bettinger (1974) have questioned the assumption that these assemblages reflect a "Big Game Hunting Tradition" like those of the Clovis tradition in the American Southwest and stress that, in all cases, the assemblages are surface finds and are undated. The context of a fluted point found with Great Basin Stemmed points at site 26Pe670 supports the idea that the fluted points were part of a "generalized food procurement tool kit" (Davis 1984:28-29). Pendleton (1979:138-169) side steps this issue by classifying the Clovis-like remains from Tonopah as "Great Basin Concave Base" projectile points and drawing comparisons to purported late Pleistocene assemblages in the northern Great Basin. However, these more northern assemblages are also poorly dated and understood.

In addition to the two Clovis projectile points from Groom Lake (Davis and Shutler 1969, figs. 2d, 3e) there are a number of reported finds near the Groom Range. Two Clovis points have been found in Fortymile Canyon in the Nevada Test Site (Worman 1969:32, 44-46, Plate 58; Reno 1985:7-9). One has been found in Garden Valley (Ryan and Reno 1984:10, fig. 1; Ryan 1985). Other points have been found in Kane Springs Wash, Caliente and Dry Lake Valley (Tuohy 1985, fig. 1).

Lake Mojave or San Dieguito

The next culture to occupy the area surrounding the Groom Range is that of the San Dieguito peoples, which is typified by Lake Mojave, Silver Lake, Borax Lake, Haskett, Parman, or Great Basin Stemmed projectile points, large leaf-shaped "knives," bifacial flaked "choppers," "gravers," "drills," and "crescents." Similar lithic assemblages have been found along the ancient shore lines of several pluvial lakes in the Mojave Desert and have been variously dubbed the "Lake Mojave Complex" (Wallace 1962), "Playa Culture" (Rodgers 1939), "San Dieguito Culture" (Rodgers 1966), "Lake Mojave Pattern" of the "Western Lithic Co-Tradition" (Davis, Brott, and Weide 1969), "Western Pluvial Lakes Tradition" (Hester 1973:62-68), "Lake Mojave/Pinto Tradition" (Tuohy 1974), "Haskomat and San Dieguito" complexes (Warren and Ranere 1968), and "Nevares Springs Culture" (Wallace and Wallace 1978).

Because the artifact assemblages bearing Great Basin Stemmed projectile points often are found at the same pluvial lake shore localities as many of the so-called "Clovis" or "Great Basin Concave Base" projectile points, Warren (1980:19-20, 27-35) and Warren and Crabtree (1972) have lumped them under the rubric of the "Lake Mojave Period." Tuohy (1969), in fact, has postulated that the burin facets on many of the Great Basin Stemmed projectile points reflect a technological linkage between the "Lake Mojave/San Dieguito" assemblages and those of the "Western Clovis Tradition." Based on her analysis of the Campbells' (1940) collections from around Tonopah, Pendleton (1979:242-251) concludes that there are significant technological differences in the production sequences of the "Great Basin Stemmed" and "Great Basin Concave Base" projectile points.

Reliable radiocarbon dates associated with Great Basin Stemmed style projectile points are rare. Warren (1980:19-20) uses radiocarbon dates from the C.W. Harris Site (Warren 1967:179-180, fig. 1) and Lake Mojave outlet (Ore and Warren 1971:2561); to argue that these points might be as much as 11,000 years old, but these dates are few and are not in direct association with the points. Bedwell (1973:142) reports a radiocarbon date of 13,200 B.P. from Fort Rock Cave in central Oregon which some researchers (Bryan 1980:83) feel may date a Lake Mojave-like point found in the cave, but again this date is not in direct association with the projectile point. Bryan 1979:186-191; 1980:83) presents 13 radiocarbon dates, ranging between 12,150 to 9,280 B.P., from Smith Creek Cave in eastern Nevada where Lake Mohave-like projectile points were found in direct association with the dates, but Lake Mojave projectile points found at O'Malley Rockshelter may date as late as 4,000 years ago (Fowler, Madsen and Hattori 1973:20, figs. 8a-c, Tables 1, 4). Finally, a cache of artifacts, including several Haskett points, from Redfish Rockshelter in the Sawtooth Range of south-central Idaho has been radiocarbon dated at 9,860 B.P. (Sargeant 1973). The Lake Mohave style projectile point from the Groom Range project area could date as early as 10 millennia ago.

Amsden (1937:90) and Rodgers (1939), as well as most other early scholars (Wallace 1958:11; Warren and True 1961:275), felt that the Lake Mojave cultural remains in the southern Great Basin reflected a regional expression of an early hunting tradition or horizon. This interpretation was founded on the observation that few, if any, milling implements were associated with these early lithic assemblages. Because most researchers considered the Lake Mojave cultural remains to be contemporaneous with the better studied Paleoindian big game hunters of the American Southwest and Great Plains, this interpretation seemed reasonable. Later scholars, however, questioned this hunting hypothesis and, instead, postulated that these early adaptations were more likely focused on the exploitation of lacustrine resources as their remains were most commonly found around the shores of ancient pluvial lakes (Bedwell 1973; Hester 1973:65-68; J.O. Davis 1978:21). Warren (1980:33-34) has argued that the apparent association between Lake Mojave Period sites and pluvial lake shores could be due only to sampling bias because it is in those environments that scholars have most commonly focused their sampling efforts. Instead, he (Warren 1967:183-184, 1980:34) suggests that "these early populations were adapted to the ecotone between woodlands and grasslands found along the eastern slope of the Sierra Nevada" during the end of the Pleistocene. It was those environments that Warren (1980:34) feels were the "richest for generalized hunters who also collected wild plants and did some fishing."

Pinto

Although most researchers would probably agree that the Lake Mojave/San Dieguito cultural materials are relatively early in age, they adamantly disagree on the placement and definition of the later, so-called "Pinto" or "Little Lake" remains. The "Pinto Basin Complex" was originally defined by Campbell and Campbell (1935) from cultural remains scattered along old banks of the Pinto River, about 200 miles south of the Nevada Test Site. Amsden (1935) describes these cultural materials as including metates, manos, hammerstones, choppers, keeled scrapers, knives, leaf-shaped projectile points and Pinto style projectile points. According to Amsden (1935:44), Pinto points, the type point of the locality, were characterized by "hasty workmanship," a "narrow shoulder and... incurving base... usually... made by a single deft blow," and a maximum thickness often 30 percent of total length."

At other sites in the Mojave Desert, however, researchers (Amsden 1937:85; Harrington 1957:49-53; Rodgers 1939:54) have recognized substantial variability in the Pinto style of dart point. Variants include the "shoulderless," "sloping shoulder," "square shoulder," "barbed shoulder" and "one shoulder" subtypes (Harrington 1957:49-53). The shoulderless variety also has been termed the "Ivanpah" by Rodgers (1939:67, Plate 19) and the sloping shoulder subtype has been called the "Paradise Pinto" by Amsden 1937:85, Plate 43f. Stemmed, indented base projectile points similar to those from the Pinto Basin also have been found well outside of the Mojave Desert (Lister 1953) and Lanning (1963:250-251) has suggested that the term "Little Lake Series" should be used for the relatively large, crude, thick and often asymmetrical projectile points from the Mojave Desert area.

This suggestions was too late, however, as the terms "Pinto" and "Little Lake Series" had become loosely applied to a wide variety of stemmed, indented base projectile points throughout the Great Basin (Hester 1973:26-28). Furthermore, researchers have found it difficult to distinguish between Harrington's (1957:51) "shoulderless" subtype and point styles called "Humboldt Concave Base A" and "Humboldt Indented Base" (Heizer and Clewlow 1968:68) and between his "barbed shoulder" subtype and styles called "Elko Eared" (O'Connell 1967). Finally, Green (1975) has argued that the distinguishing aspect of the "Little Lake Series" was a parallel oblique flaking technology that crosscut this morphological variability. This flaking pattern is rare in the Mojave Desert assemblages originally used to define the Pinto series and its variants (Amsden 1935, Plate 14m; Harrington 1957, fig. 40), but is more common to "Humboldt Series" and "Paradise Pinto" of the region and to the "Pinto" projectile styles found in the central and northern Great Basin (Thomas and Bettinger 1976, figs, 12, 44; Layton 1970, fig. 15-18). Thomas (1981b) has suggested the term "Gatecliff Split Stem" for the varieties from the central Great

Basin, whereas the more northern varieties have been called "Bare Creek Series" (O'Connell and Ambro 1968:107) and "Silent Snake Bifurcate Stem" projectile points by (Layton 1970:240-243).

These typological problems have had a noticeable effect on the dating and interpretation of the "Pinto," "Humboldt" and "Little Lake" cultural assemblages. Absolute chronometric dates are not available for most Pinto sites in the Mojave Desert; i.e., those characterized by the "crudely flaked" projectile points described by Amsden (1935, 1937), Harrington (1957) and Rodgers (1939). Because they have been found with "Great Basin Stemmed" assemblages on the shores of ancient pluvial lakes and rivers, some scholars (Antevs 1952; Campbell and Campbell 1935; Susia 1964; Warren 1980) have postulated that these "crude" subtypes of the "Little Lake Series" must be quite early in age and that they reflect a continuum from the "Lake Mojave" or "San Dieguito" era.

Other researchers (Wallace and Wallace 1978; Hester 1973; Bettinger and Taylor 1974), however, have pointed to the better dated "Pinto" projectile points from archaeological sites in the central and northern Great Basin (Hester 1973:26-28) and have argued that the "Little Lake" dart points date much later and that there might have been an occupational hiatus between the "San Dieguito" and "Pinto" periods (Figure 2-22). The radiocarbon dates from Corn Creek Dunes (Williams and Orlins 1963:12, Table 11, Plate 2a), Stuart Rockshelter (Shutler, Shutler and Griffith 1960:7-8, 12, Plate 3), and the Barnett Site of Ash Meadows (Muto, Mehringer and Warren 1976:270-273, figs. 3, 4) are associated with "Humboldt Concave Base A" and "Humboldt Indented Base" projectile points and date those styles between 5,200 and 3,800 years ago. The "Pinto Shoulderless" and "Pinto Square Shoulder" projectile points at O'Malley Shelter have been radiocarbon dated between about 4,600 and 3,700 years ago, but these specimens are similar to those recorded from the more northern archaeological sites.

The "Pinto" dart points from the Groom Range and those most commonly found in the Nevada Test Site area (Worman 1969), while displaying internal variability, are more similar to the "crude" specimens described by Amsden (1935, 1937), Harrington (1957), and Rodgers (1939).

Interpretations regarding the lifestyles of the Pinto Period populations are just as diverse as those for the Lake Mojave Period. Those researchers who assign an early Holocene age to Pinto-like cultural remains envision a relatively stable and long term adaptation developing from the earlier Lake Mojave Period (Simpson 1965:18-20, 45; Susia 1964:31; Tuohy 1974:100-101; Warren and Crabtree 1972). Again, because of its apparent association with ancient pluvial lakes and rivers, this long term adaptation has been conceived as oriented toward an environment that was initially wetter than today, but was becoming more arid as these pluvial systems slowly dried up. On the other hand, most researchers who interpret Pinto-like cultural manifestations as belonging to the middle and/or late Holocene view the Pinto Complex as occurring during or following a period, traditionally known as the Altithermal, when populations were either extremely sparse, or presumably, totally absent in the southern Great Basin (Harrington 1957:70-72; Lanning 1963:294; Hunt 1960; Bettinger and Taylor 1974; Kowta 1969:37-38; Wallace 1958:4-12). Based on the supposed tree and root holes found under the Stahl Site, Harrington (1957:70-71) postulated that the Pinto occupation there occurred during a wetter than today "Little Pluvial," that purportedly dated between 3,000 and 4,000 years ago. Paleoenvironmental records from the Great Basin indicate an environmental change during that time is unclear (Mehringer 1977). Furthermore, it is more than likely that conditions then were quite different than those at the close of the Pleistocene.

Like the preceding Lake Mojave Period, milling implements, although usually reported as occurring at Pinto Period sites (Amsden 1935:33-34; Harrington 1957:42-46), are typically considered to have been relatively unimportant (Wallace 1958:18; Wallace and Wallace 1978:7). Consequently, some scholars perceive Pinto subsistence activities as based primarily on large and small game with the collecting of plant foods playing only a minor, secondary, role (Warren 1980:43-44). However, other scholars (Davis, Brott and Weide 1969:327-328; Williams and Orlins 1963), feel that the milling of plant foods played a more important role in Pinto subsistence. Unfortunately, neither of these positions are supported by detailed studies of either settlement systems or subsistence remains, and the subsistence base during the Pinto Period remains enigmatic.

The Later Amargosans

Worman (1969:47-48), following Rodgers (1966) has referred to the makers of the "Pinto," "Elko," and "Gypsum" projectile points as the Amargosans. In Death Valley, they have been interpreted to be members of the "Mesquite Flat Culture" (Wallace and Wallace 1978:4-12). Other prehistorians have lumped these projectile point forms as representatives of the "Great Basin Archaic" (Hester 1973, fig. 25), "Little Lake" (Hauck et al. 1979:40), "Pinto-Gypsum" (Rodgers 1939:47-60; Shutler 1967:306), and "Death Valley II" (Hunt 1960:84-103) complexes, periods or phases of prehistoric cultural development. Bettinger and Taylor (1974), Warren (1980:35-49), and Warren and Crabtree (1972) would place these point forms in two separate periods: the "Pinto" or "Little Lake" and the "Gypsum" or "Newberry" periods.

Once thought to represent a weapon tip used to hunt Pleistocene megafauna (Harrington 1933:118-120), the "Gypsum" style of dart point is known from a stratigraphic context at only three sites in southern Nevada: Gypsum Cave (Harrington 1933), Etna Cave (Wheeler 1973) and O'Malley Shelter (Fowler, Madsen and Hattori 1973). Two radiocarbon dates, one of 2,900 B.P. on an atlatl dart shaft and another of 2,400 B.P. on a greasewood stick bundle, appear to date the Gypsum dart points from Gypsum Cave (Heizer and Berger 1970:14). Fowler, Madsen and Hattori (1973, Tables 1, 4) present four additional radiocarbon dates, falling between 3,920 B.P. and 2,970 B.P., from "Gypsum" levels at O'Malley Shelter. In Etna Cave, the Gypsum dart points were not dated, but occurred stratigraphically beneath cultural layers containing Elko Corner-notched projectile points (Wheeler 1973, fig. 36).

Split-twig figurines occurred with Gypsum projectiles at Etna Cave, Newberry Cave and in the Moapa Valley (Schroeder 1953; Smith et al. 1957; Wheeler 1973). However, these unique animal fetishes, radiocarbon dated between 4,095 B.P. and 3,100 B.P., have been most commonly found in the dry caves along the Colorado River from the Grand Canyon to southeastern Utah (Schroedl 1977, fig. 1, Table 1). Based on the above limited data, it appears that the makers of the Gypsum style of projectile point lived sometime between 4,000 and 2,500 years ago. This time range, of course, overlaps that for "Gatecliff" style of dart point and comparison of specimens from O'Malley Shelter reveal that these two point styles may also overlap typologically (Fowler, Madsen and Hattori 1973, figs. 9a-j, 12a-g).

The "Elko Series" of dart points include four varieties: the "Elko Eared," "Elko Contracting Stem," "Elko Side-notched" and "Elko Corner-notched" (Hester 1973:29-31). Worman (1969) has recorded all four varieties at archaeological sites on the Nevada Test Site.

Despite their common occurrence in Great Basin archaeological sites, there has been considerable controversy concerning the age of Elko Series projectile points (Heizer and Hester 1978:159-160; Thomas 1975). O'Connell (1967:132-135) has proposed that the Elko Corner-notched and Elko Eared dart point styles mark a period between about 3500 and 1400 years ago. But, Aikens (1970:45, 46, 51) has argued that since elko style dart points occur throughout the strata of Hogup Cave (7000 to 600 B.P.), they are not time sensitive artifacts. Thomas (1981b:22) reports that 98 percent of the 274 Elko Series projectile points from Gatecliff Shelter were found in strata dated between 3300 B.P. and about 1250 B.P. Elsewhere, Elko Series dart points have been found stratigraphically below Rose Spring Series arrowheads and above a radiocarbon date of 2930 B.P. at Wagon Jack Shelter (Heizer and Baumhoff 1962:130, Table 2; Hubbs et al. 1963:209-210), stratigraphically mixed with "Gypsum" style projectile points at the Rose Spring Site where they have been radiocarbon dated between 2900 and 2240 B.P. (Lanning 1963:268, Table 3; Clewlow, Heizer and Berger 1970, Table 2); stratigraphically above a radiocarbon date of 3320 B.P. at South Fork Shelter (Heizer, Baumhoff and Clewlow 1968:25-26, Table 1) and scattered throughout the deposits of O'Malley Shelter, the Scott Site, Newberry Cave and Civa II Rockshelter (Busby 1979, Table 3; Fowler, Madsen and Hattori 1973, Tables 1, 4, 27; Smith et al. 1957; Grosscup 1960:16-17). From this data, we assume that the Elko Series projectile points date sometime between about 3500 and 1300 radiocarbon years ago.

According to Lyneis (1982:177), "while Pinto sites are usually small with sparse assemblages, the result of intermittent use by small groups (Rodgers 1939:48; Susia 1964), the Elko period is characterized by large, intensively occupied sites on valley floors." She supports this claim by citing Wallace's (1958:9-12; 1977:121) interpretations that sites containing Elko or similar projectile points "appear to have been favorite camping places, reoccupied time after time by the same people." Here settlement size is used to infer fairly heavy, semisedentary populations. A similar trend in demography has been suggested for Mid-Archaic remains in other areas of the western and central Great Basin (Elston 1982:194-197; Thomas 1982:165). Warren (1980:45, 47-48), however, constructs an hypothetical model for the Mojave Desert region which postulates that the Pinto and Elko cultural manifestations reflect similar adaptations to similar climatic regimes. He argues that archaeological sites of both ages occur adjacent to springs that, today, are either "too salty for human consumption," or have discharges which he considers inadequate to "support a camp."

Environmental parameters may not have been the only, nor necessarily the most important, factors influencing cultural development in the northern Mojave Desert during this time. Large corner-notched projectile points occur with pit houses along the eastern edge of the Mojave Desert and are interpreted to mark cultural influence and intrusion from the American Southwest (Schroeder 1953, Shutler 1961). The temporal position of large side-notched projectile points is poorly known. In southern Idaho, they are presumed to date between about 7000 to 3000 years ago (Swanson, Butler and Bonnichsen 1964; Butler 1978). O'Connell (1971) reports large side-notched projectile points during the Menlo phase (7000 to 4000 B.P.) in the Surprise Valley of northeastern California. In addition, split twig figurines also occur at sites in southeastern Nevada and along the Arizona strip and have been viewed as reflecting Southwestern influence in southern Nevada (Warren 1980:46).

The Basketmakers, Pueblos and Numa

Worman (1969:48-49) has used the introduction of the bow and arrow, inferred from a shift to small projectile point sizes, to mark the transition between the "Amargosa Complex" and "Basketmaker Culture" on the Nevada Test Site. This same change in projectile point sizes characterizes what other researchers in the area have termed the "Saratoga Springs Period" (Wallace and Wallace 1978:12-21; Warren 1980:48-52), "Haiwee Period" (Bettinger and Taylor 1974:19), "Death Valley III Period" (Hunt 1960:136-140) or "Rose Spring and Eastgate Period" (Hester 1973, fig. 25). As Hester's terminology reflects, these small corner-notched and contracting stem arrow points have been called the "Rose Spring" and "Eastgate" series or, simply, "Rosegate Series." Commonly found at archaeological sites in and around the Nevada Test Site, these arrow points are widely distributed throughout the Great Basin and American Southwest. But, as noted by Bettinger and Taylor (1974:19), they have been rarely found in the lower Mojave and Colorado deserts. Rose Spring Corner-notched projectiles occurred in strata dated about 900 years ago at O'Malley Shelter (Fowler, Madsen and Hattori 1973, Tables 1, 4) and have been found stratigraphically above Elko Series projectiles at the Rose Spring Site (Lanning 1963, Table 3). Heizer and Hester (1978:162, Table 6.4), Pippin, Davis, Budy, and Elston (1979, Table 9) and Thomas (1981b:30-32) have summarized the radiocarbon evidence for the age of this arrowhead style and concluded that it dates between about 1500 and 800 radiocarbon years ago.

Throughout most of the western Mojave Desert, the material culture assemblages accompanying the Rose Spring and Eastgate arrow points remain essentially the same as during previous periods. Consequently, Warren and Crabtree (1972) have hypothesized a continuum between the "Gypsum" and "Shoshonean" periods in this region. However, in southeastern Nevada, especially along the lower Virgin and Muddy rivers, small Rose Spring-like arrow points are associated with pithouses, olivine and limestone tempered pottery, and adobe surface structures (Harrington 1930; Shutler 1961). The sedentary nature of these Virgin Branch Anasazi settlements reflects an increasing dependence on maize horticulture and the major impetus for these cultural changes was undoubtedly the fertile bottom land along the Virgin River and its tributaries. Salt and turquoise deposits in this area, however, also appear to have attracted the Anasazi (Shutler 1961:58-61). In fact, Anasazi interest in mining turquoise extended as far west as the Halloran Spring region north of Silver Lake, California (Rodgers 1939).

The occurrence of Anasazi pottery in the Groom Range indicates that these Pueblo peoples also may have entered the area or at least traded their pottery to its occupants. This possibility raises intriguing questions regarding the interaction between the Pueblo peoples and locally developing Archaic populations. Thus, we suspect from the associations of Southern Paiute Brownware with Anasazi pottery at several archaeological sites in the Groom Range and on the Nevada Test Site, that the Numa and Anasazi knew one another and probably interacted (Shutler 1961:11, Table 7; Worman 1969:43). The contemporaneity between these two cultural groups is also indicated by Burial No. 3 at Lost City, where a Southern Paiute Brownware jar and an Anasazi Washington Black-on-gray bowl were both grave goods for the same individual (Shutler 1961:29). However, it was not until about 1500 years ago that Anasazi influences became well established in southern Nevada. Puebloan architecture and gray and black-on-gray painted pottery are abundant in the Moapa and Virgin Valleys 100 km east of the Groom Range and reflect Anasazi settlement in that region.

Warren (1980:49) postulates that the cultural adaptations during the Saratoga Springs Period was essentially similar to the preceding period. Thomas (1982) offers a similar interpretation for the central Great Basin. Lyneis (1982:177), on the other hand, views this period as marking a broader use of landscape than during earlier periods in the southern Great Basin. The abandonment of the large, intensively occupied valley floor camps apparently accompanied this diversification in land use. Comparable adaptive shifts have been hypothesized for the western Great Basin (Elston 1982:198). However, Bettinger (1975, 1977) outlines a shift in adaptive strategies for Owens Valley during this time that involved the establishment of large base camps for the intensive exploitation of pinyon nuts. He correlates this shift with a warming and drying trend in environment and, concomitantly, with a reduced productivity of both desert shrub and riparian resources. Population densities are also hypothesized to have increased during this time in Owens Valley.

About 700 years ago the Anasazi occupation and influence in southern Nevada appears to have ended (Shutler 1961). It was also during this time that according to linguistic reconstructions (Lamb 1958; Hopkins 1965; Miller 1966; Miller, Tanner and Foley 1971; Goss 1968; Fowler 1972) the Numic speakers are supposedly to have expanded throughout the Great Basin from their homelands in the Mojave Desert. Various researchers (Euler 1964; Aikens 1970), most recently Madsen (1975) have postulated that this spread, because of competition for resources, may have been an important factor in the disappearance of the Anasazi. Bettinger and Baumhoff (1982) have presented a model that contrasts the Numic adaptation with previous adaptations and purports to explain why and how the Numic adaptation, oriented toward intensive seed exploitation, replaced earlier and more generalized adaptations. The usual projectile points used by Numic speakers was Desert Side Notched Series. This style of small side-notched arrowpoint is commonly found at late prehistoric and historic aboriginal sites throughout the western United States (Kehoe 1966). Baumhoff and Byrne (1959:60-61) suggest that Desert Side-notched arrowpoints were commonly made between A.D. 1500 (450 B.P.) and historic times. Based on radiocarbon dates from Gatecliff Shelter and several other sites in the eastern Great Basin, others (Bettinger and Taylor 1974; Heizer and Hester 1978:163-164; Thomas 1981b:27) would extend this temporal range from A.D. 1300 (650 B.P.) to historic times.

Ethnohistory

The occupants of southern Nevada at the time of Euroamerican contact were widely scattered hunters and gatherers who spoke similar Utoaztecan dialects. These people usually referred to themselves as the Numa but are now commonly called the Southern Paiute and Shoshone (Fowler and Fowler 1971:37). Early explorers and immigrants uniformly regarded these natives as being the lowest form of life they had yet seen. Yet, the aboriginal Numa had successfully adapted to an environment that was harsh enough to tax the resources of the newcomers. A flexible seasonal round designed to encounter various resources at peak productivity with an appropriate number of resource exploiters permitted the Numa to coordinate the seasonal availability of plants and animals into an overall subsistence-settlement pattern. This pattern was normally centered around a semi-permanent base camp where food and fuel could be stored for consumption during the winter. Between early spring and fall, subsistence groups would leave their residential bases in search of seasonally available resources. The usual subsistence group was an informal and highly changeable group of bilateral relatives, friends, and acquaintances, often no larger than a nuclear family that has been called a bunch or kin and clique for want of a better term (Malouf 1966:4). In the fall, with the co-occurrence of the pinyon harvest and rabbit drives, much larger groups commonly aggregated for a fall festival or fandango, which was the major social event of the year, with groups traveling long distances to participate. The closest documented fandango and rabbit drive location to the project area is White Rock Spring, which is also the site of a Shoshone winter camp (Steward 1938:97). Steward notes several other encampments and resource use areas at the southern end of the Belted Range and in the area of the Nevada Test Site. Camps are also noted by springs in the northern end of the Belted Range, which is at the western edge of his geographic coverage (Steward 1938, fig. 7).

Documentation of late aboriginal occupants of the Groom Range suffers from the location of the study area on the boundary between the Southern Paiute and Shoshone (Stewart 1966 Maps 4-14). Ethnographic studies have concentrated on more central areas. Little is known of the nearest concentration of Southern Paiute, which is in the Pahranagat Valley. Powell and Ingalls noted a "Pah-ran-a-guts" tribe with 171 members in the Pahranagat Valley (Fowler and Fowler 1971 Table 1). A letter from James M. Day printed in the Carson City Appeal (7-25-1865) describes the native population in the vicinity of the Pahranagat Mining District:

> "The Indians in the vicinity of these mines are a band of the Piute tribe, about four hundred strong, and know but little of the White man. But a few of them had ever seen a 'pale face' before they saw our party. they are disposed to be friendly, and are industrious.
>
> To a limited extent and in a rude manner they cultivate the soil; raise wheat, corn, pumpkins, irrigate the soil by conveying water through ditches constructed by them the distance of a half mile in some instances with no other tools than sharpened sticks to work with." (reprinted in Fowler, Madsen, and Hattori 1973)

Kelly (1934:554) notes that the western boundary of the "Paranigat" band was Desert (Tikaboo) Valley. The Shoshone were noted as speaking an unintelligible language to the Southern Paiute, but relations between the tribes were cordial. Considering the wide ranges of both tribes of hunter-gatherers, and the common occurrence of forays into other tribal areas, and intertribal marriage (Steward 1938:95), there can be little doubt that the Groom Range was utilized by both Shoshone and Southern Paiute.

Although the remoteness of the Groom Range would have encouraged aboriginal lifeways to continue into the early twentieth century, positive ethnographic evidence is lacking. Stretch (1867) noted a general scarcity of Indians throughout the district. Indians were employed hauling water to the mining camp of Tem-piute just north of the Groom Range (Paher 1970:303). The Wheeler (n.d.) Atlas shows an "Indian Rancheria" northeast of Tempaiute [Bald] Mountain. By the 1930's no aboriginals were known to live in the Groom Range, though a small group consisting of one adult male and several females from Johnnies Water visited the Groom Mine in the 1930's to barter pine nuts for a check with which to buy syrup in Hiko (Sheahan and Sheahan, personal communication).

Patterns of Resource Procurement

by L.C. Pippin

Before discussing the prehistoric cultural context, it is useful to review various resource procurement strategies followed by the historic aboriginal inhabitants of the Great Basin. This review, however, is not intended to cover all resource procurement. Rather, it focuses only on the major resources found in the Groom Range. The intent of this exercise is to provide a baseline model of known aboriginal practices in order to assist model building concerning the function of various prehistoric cultural resources in the study area.

Pine Nut Procurement

Several pine nut procurement strategies are represented in the ethnographic record. These range from the simple pattern of small social groups making short term pine nut collecting excursions from a residential base located outside the pinyon-juniper woodland to the more complex strategy of concentrating residential bases in the pinyon-juniper woodland and using the pine nut harvest to support relatively large social groupings throughout the winter.

Steward (1933:241-242; 1938:52-53) noted that, when pinyon nut crops were poor, the Owens Valley Paiute would travel to small, family plots, gather whatever nuts were available, and then transport this harvest to their winter villages in the valley. Wheat (1967:14-15) describes a similar pattern for the Northern Paiute who occupied the Carson Sink. Because the mature nuts were gathered using wooden "pinyon hooks," conical carrying baskets, and various perishable sacks and mats, the archaeological remains produced by these activities would be minimal (McGuire and Garfinkel 1976:83; Thomas 1971:47). Nevertheless, there are various modifications in the above pattern that would leave non-perishable archaeological remains in the resource zone.

While pine nuts are relatively easy to remove from dry mature cones, the immature cones are rather difficult to open unless subjected to a drying treatment. This could be accomplished by piling the cones on sunny slopes, heating them over or in camp fires, or roasting them in stone and/or grass lined earth ovens (Dutcher 1893:381-382; Steward 1933:242; Stewart 1941-374; Wheat 1967:14). A hammerstone and anvil might also be used to crush open stubborn cones (Dutcher 1893:382). In addition, grass, juniper bark, pinyon branch and/or rock lined and covered pits were used by the Owens Valley and other Northern Paiute groups to cache excess nuts after unusually abundant harvests (Davis 1965, fig. 4a; Steward 1933:242; Stewart 1941:374; Wheat 1967:14). These features and artifacts, of course, might be preserved in the archaeological record.

Finally, temporary camps might be established in the pinyon woodlands during the nutting season, but abandoned as soon as the harvest was complete. An ethnographic example of this sort of campsite was observed by Dutcher (1893:379-380) when he accompanied the Panamint Shoshone in 1891. It consisted of five or six circular structures or "corrals," with 60 to 90 cm (2 to 3 ft) high, vertical walls constructed of brush and pinyon branches. These "corrals," each 2.5 to 3 meters (8 to 10 ft) in diameter, were used as windbreaks during the night and, occasionally, small hearths were maintained in the center of the structure. The archaeological remains of such a temporary camp would probably be quite similar to those discovered by Fenenga and Heizer near Minden and Gardnerville; e.g., areas cleared of stones, firepits, rock circles and scattered concentrations of discarded and lost artifacts (Busby 1974; Fenenga 1975, figs. 1-7).

When pinyon crops were abundant and winters were relatively mild, the Numa might establish more permanent winter settlements in the pinyon-juniper woodlands (Davis 1965:34-35; Steward 1933:239; Steward 1941:371). These settlements differed from temporary campsites not only in their length of occupation, but also in the nature of activities and features associated with their occupation. First, the houses used at the residential bases were often more substantial and permanent than the temporary camp's windbreak or "corral." Steward (1933:242-263) describes the Owens Valley Paiute winter house as a "tent-shaped" structure constructed by spanning a ridge pole, about 4.5 meters (15 ft) long, between two uprights, about 2.5 meters (6 to 7 ft) high, and then using this ridge pole to support a series of leaning posts interlaced with pine boughs. The Mono Lake and Pakwidokado Northern Paiute, on the other hand, constructed a conical-shaped house made of pinyon and juniper poles and boughs (Steward 1933:264; Stewart 1941:378).

The occupation of a residential base throughout the winter, secondly, required stores of food either within the encampment or at various caches throughout the surrounding resource zone. Likewise, because the maintenance of a population over an extended period of time would require foodstuffs other than just stored pinyon nuts, we would expect the pine nut procurement strategy to be combined with the exploitation of other available resources. Hence, Steward (1933:254; 1938:54) notes that the Owens Valley Paiute held communal rabbit, deer and other large game drives during the fall after the pinyon harvest. As mentioned above, this practice also was followed by the Belted Range Shoshoni and other Numic peoples around the project area, as well as various Northern Paiute and Washo groups of western Nevada (Davis 1965:34-35; Downs 1966:27-32; Wheat

1967:14-15). Although we will discuss the various procurement strategies used to exploit these resources later, the important point here is that the semi-permanent winter camps were the hubs of many different subsistence activities whether they were located in the pinyon-juniper woodland or in other resource zones.

Finally, the Northern Paiute of the western Great Basin, as well as other Great Basin groups would usually assemble for an annual social dance or fandango (Davis 1965:34; Harris 1940:53; Hopkins 1883:46-48; Steward 1933:320-321; 1938:54, 60-61). Although these gatherings varied somewhat between groups, they usually included gambling, dancing, trading, philandering and courting, and praying for abundance of critical resources. Likewise, while some groups held their fandangos during the spring antelope hunt (Hopkins 1883:46-48); other groups gathered after the fall pine nut harvest (Steward 1933:320-321). Regardless of when they were held or their exact nature, these fandangos were commonly held at the larger semi-permanent villages and attracted up to 300 people in some areas (Harris 1940:53; Steward 1938:237). Thus, they have commonly been viewed as effective mechanisms of social integration during which kinship ties and group solidarity were strengthened (Harris 1940:68-69; Steward 1938:90). Thomas (1972:146-148) has postulated that, although this may be true, fandangos also operated as "clearing houses" for the dissemination of environmentally relevant information; i.e., participants could share information concerning the location and abundance of critical resources such as water, Artiodactyls and pinyon nuts. Their role in the redistribution of resources, likewise, should not be overlooked.

Before considering the hunting of large and small game, there is one final aspect of pinyon nut procurement that should be considered. Several scholars have emphasized the periodic unreliability of pinyon trees to produce nuts (Bettinger 1975:117-118; Steward 1938:27-28; Thomas 1973:160-161). But this fact should not be interpreted to mean that pinyon nut yields were unpredictable. The life cycle of the pinyon tree allows astute observers to predict the probable nature of any specific crop as much as a year and a half in advance (Little 1938; Lanner 1981:76-81). By observing the new female cones, aborigines could not only tell where specific crops would be poor, but also could schedule where and when pinyon crops would be worthwhile harvesting. The practice of sending scouts into the mountains in order to find the most promising pine nut area has been recorded for the Northern Paiute who lived in the Carson Sink region, but undoubtedly applies as well to other Great Basin groups (Wheat 1967:12-13). Thus, by annual adjustments of pinyon nut procurement zones and increased residential mobility, the Great Basin Native Americans could buffer the impact of periodic poor pine nut crops.

Hunting Strategies

Steward (1938:33) felt that the procurement of game was only of secondary importance in Great Basin aboriginal subsistence activities and this view has been widely echoed in the archaeological literature (Heizer and Baumhoff 1962:210-218; Thomas 1969:398-399). Nonetheless, as emphasized by Thomas (1983:41-57), the Numa exploited a large number and range of fauna and the tactics used in this procurement undoubtedly had a major influence on their adaptive strategies. Binford (1978) has distinguished between two major strategies of hunting game: the encounter and the intercept. Briefly, the encounter strategy, typically used to exploit low density game, includes both the intentional and opportunistic search for game by traversing a region inhabited by that game. The intercept strategy, on the other hand, involves the monitoring of game movements, usually as herds, and the attempt to ambush this game at predetermined hunting locations.

The driving of large game into enclosures where they could be conveniently shot with arrows is probably the most elaborate form of intercept hunting followed by Great Basin aborigines. Although usually mentioned in connection with the procurement of antelope, Stewart (1941:366) notes that the Pakwidokado also hunted deer by this method and Curtis (1926:71) recorded the Paviotso to have driven both deer and bighorn sheep "between very long wings paralleling a game trail, and so into a corral." Stewart (1941:219) describes the features of central Nevada as consisting of a pole and brush corral with long wings converging to its opening, but states (Steward 1933:252) that the corrals built by the Owens Valley Paiute lacked the converging wings. In some areas, women were stationed along the wings of a corral, or the sagebrush wings themselves might be set on fire as game were driven into the enclosure (Lowie 1924:304-305).

The Southern Paiute of the Kaibab Plateau used a slightly different form of game drive. There, a long, 150 meter (500 ft) barrier was constructed with an opening toward its middle and antelope, driven toward the fence, would be shot as they passed through this opening (Kelly 1964:50). Thomas and McKee (1974) discovered a prehistoric rock alignment in the Toiyabe Range of central Nevada that might have functioned in a similar fashion. The Shoshone around Fort Ducherne dug a deep pit into which game were driven between the converging arms of a similar sagebrush drive (Lowie 1924:199). Yet another variation of this strategy is recorded for the Toedokado of the Carson Sink area who braided a sagebrush rope "about the size of a man's wrist...and sometimes a mile long," that was stretched over the tops of sagebrush, thereby forming a corral (Stewart 1941:22). Finally, in Owens Valley, "men stationed 100 yards apart, hunted a large region, advancing with sage bark torches, firing brush and closing in to drive deer into a great circle, then shooting them down" (Steward 1933:253).

Despite this variability in the construction and operation of these forms of elaborate game drives, they all shared the characteristic of a communal effort (Steward 1938:34). Although some groups used dogs and/or fire, most systems relied on humans to drive and channel the game toward the enclosures (Stewart 1941:366-367). Some drives covered as much as 32 km (20 miles) of terrain (Egan 1917:238-241). Shamanism was an important element associated with most game drives and ceremonial dancing, smoking, etc., usually preceded the communal hunt (Hopkins 1883:55-57; Lowie 1924:303-305; Steward 1938:34). Consequently, the drives were usually held during the time of year (spring or fall) when population massed at residential bases.

Driving game past concealed hunters was also a common intercept strategy used by Great Basin aborigines in the procurement of large game (Stewart 1941:366-367). Muir (1894:320-322) recorded many nest-like stone enclosures on Great Basin summits that were probably used in the procurement of bighorn sheep (Pippin 1979). Hunting ambushes of this nature are commonly recorded in the Great Basin archaeological record (Cressman 1942:66, 69; Fowler and Sharrock 1973:101; Heizer and Baumhoff 1962:18-20, 38-45, 52-56). Stewart (1941:366-367) notes that the Northern Paiute of western Nevada dug pits beside trails and springs where hunters would lie in wait of game. Although this strategy of hunting could require a large group effort, hunting parties probably consisted of only a few individuals.

The individual encounter strategy of hunting large game was probably the most common, but least efficient, hunting strategy employed by Great Basin aborigines. Steward (1938:36) associated this method particularly with the hunting of deer, although it was probably used for procuring all large game. Several groups used animal skin disguises while stalking game (Lowie 1909:185; 1924:195-197; Stewart 1941:219); whereas, others hid behind tuffs of rabbitbrush (Kelly 1964:50) or simply tracked the game to opportunistic killing zones (Fowler and Fowler 1971:47). As pointed out by Thomas (1982:52-53), this strategy of hunting, because it lacks the need for facilities such as ambushes and game drives, would result in rather low archaeological visibility.

Small game were trapped and snared using a variety of techniques including spring-pole traps, nooses set on game trails and at rodent burrows, basket traps, deadfalls and pitfalls (Steward 1933:254-255; Stewart 1941:368). Burrowing animals could be dug, flooded or smoked out of their homes during periods of hibernation or rest. However, most small mammals were probably procured throughout the year, largely by individual hunters using an encounter strategy.

During the fall, usually in connection with other communal activities, large rabbit drives were held throughout the Great Basin (Chamberlin 1911:28; Lowie 1924:196-198, 1939:327; Kelly 1932:88, 1964:50-51; Steward 1933:253-254; 1938:82-83, 97-98, 122, 163, 179). Most groups used a series (2 to 10) of large nets, 30 to 100 cm high and 15 to 30 meters long, that were stretched across the valley floor and propped up with sticks (Wheat 1967:58-59, fig. 12). Part of the hunting party would beat the brush, thereby chasing the rabbits toward the nets; whereas the rest of the party would stand behind the nets with clubs or bow and arrows. In the Salt Lake area, instead of using nets, the Shoshone would surround and kill the rabbits with clubs or drive the rabbits into a series of loop snares (Steward 1938:179). Lowie (1924:197) noted that up to 40 rabbits per person could be obtained in one day. In some areas, as at Yucca Flat (Steward 1938:122), these drives lasted up to a month, but most groups gathered for only a week or so (Stewart 1941:368).

History

The study area is located in one of the most desolate and isolated portions of Nevada. This isolation has had a significant effect on the local history. The range has nearly escaped the usual effects of our civilization, and has not been fully mapped at a detailed scale to this day. Even the current name for the range is of recent origin, being coined by Humphrey during his geologic reconnaissance of the Groom Mining district in 1945. Earlier references to the range refer to it as the Naquinta Mountains, the Toquima Range, or most commonly as a portion of the Timpahute Range which is currently considered to end at Coyote Summit at the north end of the Groom Range (McLane 1978:50; Carlson 1974:128-129).

Political History

Political control of the study area was claimed by Euroamerican powers long before such power could be implemented. Although within the bounds of Alta California the inhospitable terrain of Nevada discouraged any attempts at Spanish penetration; such attempts being diverted either to the east toward the Great Salt Lake, or west toward present day California. This neglect of virtually all of what is now Nevada was continued by the Mexican government, after it inherited the region in the 1820's.

With the conclusion of the Mexican War in 1848, control passed to the United States of America. The Compromise of 1850 placed the study area in the Utah Territory but the lack of effective government from Utah of the population centers of the Comstock and Carson Valley led to the creation of the Nevada Territory in March, 1861. The initial boundaries of the Nevada Territory did not include the study area, but this area was added to the new territory on July 14, 1862 by removing St. Mary County from Utah Territory (Elliott 1973:75). On October 31, 1864 the Nevada Territory was incorporated into the state of Nevada. The study area was within the boundaries of Nye County (General Land Office 1866) until the mining discoveries in the Pahranagat district led to the formation of Lincoln County on February 26, 1866 (Hulse 1971:14).

Exploration

The main lines of exploration through Nevada followed the two major east-west trending watercourses of the Humboldt/Carson or Truckee Rivers in the north or the Colorado River in the south. These two routes, which would become known as the Humboldt Route and the Old Spanish Trail, effectively diverted nearly all explorers and emigrants away from the hazardous unknown desert area in between. The few early attempts at exploring this area uniformly discouraged other travelers from attempting to cross or settle the area.

Jedediah S. Smith 1827

In 1827 Jedediah Smith and two companions crossed the Sierra Nevada and returned to Utah via central Nevada. For years the exact location of his route was shrouded in mystery, but recently Smith's diary of the trip has been discovered and published. This account reveals the difficulty of the passage, for game was nearly impossible to obtain and water was hard to find even for this select party of expert mountain men, and a reasonably exact location for the route, which passed about 60 miles north of the Groom Range (Smith 1977:180-181). Tales of Smith's tribulations escaping the Nevada desert discouraged further exploration for nearly a quarter of a century. Cryptic notes derived from his report of the region's lack of game and aridity (for example those reported in Bancroft and Victor 1890:38,39) continued to be reproduced on maps at least until 1866 (General Land Office 1866).

Death Valley Party 1849

Most parties of emigrants across the Great Basin following the discovery of gold in California in 1849 used the established routes along the Humboldt River or the Old Spanish Trail. A significant exception is what is known as the Death Valley Party, which ignored the sound advice of their guide to follow the Old Spanish Trail and instead turned westward into Nevada from Beaver Creek, Utah. The portion of the trail from Utah to the White River is well documented because it was followed by the William H. Dame exploring party in 1858, from which we have an accurate map (Martineau 1858). This party was guided along the trail by Asahel Bennett, who was a member of the 1849 party (Martineau 1890:296-297; McLane 1981:49; Wheat 1960:129). The 1849 party split into several groups that were constantly merging and separating while each group attempted to find superior routes across the unknown country. This makes any current attempt to locate these trails in detail across the portion of the route from the White River to Groom and Papoose Lakes a confusing and probably futile effort (Bergin and Roske 1978:12-16). There is no doubt that two or three of the alternate routes the trail passed through or by the project area in November of 1849. The only reliable accounts of the passage, the log of Sheldon Young and Louis Nusbaumer's diary place contingents at Groom and Papoose Lakes respectively (Young 1849:272-273; Nusbaumer 1849:37; Reno and Pippin 1985:147-148). Manly's account, written long after the event, supplements Nusbaumer's' locations for the group (the Bennett-Arcane Party) which proceeded south from Papoose Lake (Manly 1894:125). Manly retraced the portion of the route from Utah to the Groom Range in later years. He followed the route the Mormons had taken in 1858, continued to Hiko, past Logan Spring, passed Mt. Irish on the south side, and crossed Tikaboo Valley to "Tickapah" Spring. He felt that it was at this spring that his portion of the party decided to cross the Naquinta Mountains to Emigrant Valley before turning south to Groom and Papoose Lakes (Long 1950:221). The actual adventures and observations of the Death Valley Party in Nevada are of far less significance than their sufferings in Death Valley, which were so widely publicized that the route across Nevada between the 37th and 38th parallels was shunned by emigrant groups and feared by travelers.

John C. Fremont 1853

The fifth and last of Fremont's explorations passed just north of the study area. This party started from Kansas in September 1853 with the intent of proving the existence of a practical route for a railroad between the 37th and 38th parallels (Fremont 1984a). The great difficulties encountered in the mountains of southern Utah during the winter passage did not improve the image of the route. Parowan, Utah was reached on February 8. Faced with the decision of how to proceed across the rest of the Great Basin, Fremont chose to continue westward when he heard of the inability of Mormon explorers to penetrate the region due to lack of water. Fremont and 18 others continued westward from Cedar City on February 20, leaving Utah at the 38th parallel and striking the Sierra Nevada at the 37th parallel about March 15 (Fremont 1984b; 1854:478-479; McLane 1981:48-49; Carvalho 1856:77-205). After the rigors of the high mountains of Utah, Fremont found the Great Basin to be easy going. He was able to wind through the valleys which were usually barren of snow, avoiding the snow on the surrounding mountains. Fremont's description of the portion of the Great

Basin he traversed is an excellent impression of the country (Fremont 1854:479):

> We were thus always in a valley and always surrounded by mountains more or less closely, which apparently altered in shape and position as we advanced. The valleys are dry and naked, without water or wood; but the mountains are generally covered with grass and well wooded with pines; springs are very rare, and occasionally small streams are at remote distances. Not a human being was encountered between the Santa Clara road, near the Mormon Settlements and the Sierra Nevada, over a distance of more than 300 miles.

The map in Fremont's (1887) Memoirs is the only reasonably accurate representation of his route. Fremont is known to have plotted the location of Parowan during his stay there (Spence 1984:475). The longitude and latitude was measured from a modern 1:250,000 scale map and from Fremont's map. The two matched well considering the error caused by not knowing precisely where Fremont took his sightings in Parowan. Fremont's location was about 1 mile to the east and 3.5 miles north of the location on the modern map. Since longitudes and latitudes are shown on Fremont's map, as well as hachures depicting mountain ranges along the route, his course of travel can be ascertained with accuracy. He appears to have followed the 1849 Death Valley Party trail to the north end of the Seaman Range, turned west passing through the Golden Gate Range to Garden Valley, southwest through the pass between Worthington Mountain and the Quinn Canyon Range, continued southwest across the north end of Sand Spring Valley to the southern terminus of the Quinn Canyon Range, crossed the southern end of Railroad Valley, passed between the Reville and Belted Ranges, turned southwest to pass through Cathedral Ridge and continued westward. The nearest camp to the study area was at the north end of Worthington Peak. The party traveled quickly across the north end of Sand Springs Valley, reaching a camp at the south end of the Kawich Range in a single day, a distance of about forty miles. (cf. Spence 1984:475; McLane 1981:49). Unfortunately, the Fifth Expedition was a failure. It was not widely publicized, lacked government support, and Fremont did not follow through with his usual thorough documentation of the discoveries. Due to the near absence of publications by Fremont, the main source of information concerning the expedition is the diary of Solomon Nunes Carvalho. Unfortunately, the rigors of the Utah mountains incapacitated Carvalho, who was forced to leave the expedition at Parowan (Carvalho 1856:205). Fremont did not succeed in convincing the public or the government that this was a practical route across the Great Basin, leaving the study area a wilderness.

William H. Dame 1858

The Mormon settlers of Utah undertook exploration of the desert country surrounding Salt Lake as soon as they arrived in the area (Arrington 1958:42-43), but exploration of the region near the study area was undertaken for more pressing reasons than merely a desire to know the country in order to best utilize the available resources. In 1858 Bringham Young and the Mormon Church were engaged in a hazardous political battle with the United States for control of Utah. Although both antagonists were working toward a compromise, the Mormon Church was preparing for desperate measures if needed. Outright war with the United States was no longer seriously considered as it had been the year before, but preparations were being made for a possible further exodus from the current population centers to the desert wastes (Arrington 1958:180-184). Two parties were sent to explore the desert of Southwestern Utah, which includes the eastern portion of present-day Nevada, with the intention of finding oases separated from the rest of the world by desert barriers which small groups of people could penetrate but would stop any army (Martineau 1890:249).

The exploring party called the "Desert Mission", led by William H. Dame, traveled the country east and north of the Groom Range. This party followed the route of the Death Valley 49ers, guided by a member of the Death Valley Party, Asahel Bennett. The 1849 trail was followed for over 100 miles, past Bennett's Spring. A side trip by a portion of the expedition traveled through the Golden Gate Range to the Quinn Canyon Range only 25 miles north of the project area (Martineau 1858; 1890:299-251, 296-300; Wheat 1960:125-132; McLane 1981:49-50). The Desert Mission was equipped with all of the equipment required to start farming on promising land, but the only place it found acceptable was the area of Panaca on the Meadow Valley Wash. In general, the exploration was a failure for it did not locate the expected quantity of oases. Although Mormon settlers occupied a few of the well-watered valleys in extreme eastern Nevada, the desert to the west, including the project area, continued to be regarded as a wasteland which could not be permanently settled or easily traveled.

Blasdel Party 1866

In March, 1865 the first mining locations were made in the Pahranagat District, which is about 25 miles northeast of the Groom Range. Excitement over the new discovery soon led to a rush to the area and agitation for creation of a new county centered on the district. Most of the people who went to the district found it highly over-rated and the best locations already occupied but despite discouraging reports the 1866 Nevada legislative session passed a bill to create Lincoln County provided three-hundred signatures could be obtained from local residents on a petition requesting formation of the county (Hulse 1971:15-16). Governor Henry G. Blasdel personally took the petition to the new district. Instead of taking the established central route across Nevada via Austin and Egan Canyon, which was linked to Pahranagat early in 1866 (Bourne 1973:64-66), he chose a more southerly route across almost unknown territory in hopes of finding a more direct route between the population centers in western Nevada and the new mines (Stretch 1867:141).

Blasdel and a party of over 20 members left Silver Peak on April 3. They traveled through Death Valley and the Amargosa Desert to Indian Springs, which was reached on May 11, Proceeded due north up Indian Spring Valley to the southern end of the Groom Range which was reached on May 14, and finally turned northeast toward Pahranagat. The party ran short of supplies, which required the governor and another man to go to Logan City for additional provisions. By the time they returned to the main group at Summit Spring (the location of Summit Spring is shown on Hamel 1869), the party was reduced to eating lizards and one man was dead (Stretch 1867:141-145; Angel 1881:477; Hulse 1971:15). Wheeler (n.d.) memorialized the privations of Blasdel's party on his atlas by naming the pass between Indian Springs Valley and Emigrant Valley 'Hungry Hill Summit'. Blasdel was not able to find the necessary signatures for his petition and returned to Carson City via Austin, but ten of the party, including the state mineralogist, R. H. Stretch, continued their exploration of the area surrounding the Groom Range. They proceeded north to Coal Valley, circled the northern end of Mount Worthington, and then proceeded southward to White Rock Spring on the Nevada Test Site (Stretch 1867:146-147). Although Stretch felt that this last portion of the route was adequately supplied with wood, water, and grass; the desolate image of the first portion of the journey to Pahranagat was what endured. In a letter to the Territorial Enterprise dated June 28, 1866 he wrote, "In plain words the country we saw was not worth the paper on which I have written these letters..." A typical summary of the exploration appears in Bancroft and Victor (1890:271-272) which states that having "...become involved in barren wastes without food or water, they narrowly escaped destruction. As it was, one life was lost, and much suffering endured by the party." Again, the region repelled encroachment by Euroamerican explorers. The entire region west of Pahranagat was still collectively referred to as Death Valley (Bourne 1973:62). The route to Austin blazed by the party was the only usable link with northwestern Nevada (Townley 1973:31).

Government Surveys

Wheeler Survey 1869, 1871

The first systematic survey of south-central Nevada was by Lieutenant George M. Wheeler. His "Explorations and Surveys West of the 100th Meridian", following the pattern of the King and Hayden surveys (Humphreys 1871), which was organized by the U.S. Army for the purpose of mapping the area and collecting a broad spectrum of scientific knowledge.

In 1869 Wheeler passed through Nevada on his first general reconnaissance of the West. During the 1869 itinerary the party left Indian Springs, and following the route of the Blasdel Party, moved north up Indian Springs Valley camping at Quartz Spring (camp 62) and continued north to make its next camp (camp 63) at Summit Spring (called Mud Spring on Wheeler Atlas Sheet 66) on the pass between the Groom Range and the Jumbled Hills. The party then proceeded across Tikaboo Valley, which is referred to merely as "DESERT PLATEAU," to the Pahranagat Mining District and out of the study area. The chief contribution of this reconnaissance was an an accurate and detailed map of the country along the route of travel at a scale of 1 inch to 12 miles based entirely on direct observation instead of conjecture (Hamel 1869, Wheeler 1869). Features located on this map in the Groom Range include Tikaboo Spring, the Groom District, Timpahute Mt (the present Mt. Baldy or Bald Mtn.), a road along the range, and an "Indian Rancheria" near Tikaboo Spring. The Groom Range itself is referred to as an extension of the Timpahute Range. It was during this reconnaissance that he conceived of the grandiose idea of mapping much of the Western United States (Bartlett 1962:337).

In 1871 the survey went directly through the Groom Range. On July 23, after a days travel from Silver Canyon, most of the main party met at Naquinta Spring in the Groom Range, where Wheeler observed, "...the desert stretching out along our western horizon" . While in the Groom Range, geologist Grove Karl Gilbert was able to visit the Groom Mine and make some observations on local geology (Wheeler 1872:44-45; 1889:266; Gilbert

1875:38,39,41,42,169,170,181). From Naquinta Spring the party proceeded south to camp at Disappointment Spring then went through Groom Pass to White Bluff (Whiterock) Spring (Wheeler 1872:16). The route of the exploring party can be followed with precision from the field notes (Wheeler 1871a; 1871b) made by the topographical party composed of the topographer, in this case P.W. Hamel, who took bearings of the meandering course of travel, an observer taking readings on a cart mounted odometer, and another observer who took barometric readings to determine the elevation of all turning points (Wheeler 1872:21). In addition, scientific observers, packers and a cook probably accompanied the party (Anonymous 1877:67). Plotting the route on a modern map from the field notes resulted in a close fit to topographic details, even including a minor course change along the shore of Groom Lake. This route is indicated on the map included in the preliminary report (Nell 1872) and is also shown as the route of the Death Valley Party on the Wheeler Atlas (Wheeler n.d.).

Even for such a strong party, this portion of Nevada commanded as much respect as when Blasdel passed through. A summary of the difficulties is provided by Wheeler (1872:16):

> It was thought at first that it would be impracticable to make this march with the entire train, and that it would be necessary to surround this desert section in traveling along lines partially known, and entering it at certain points with parties not numbering not more than five or six. It was almost impossible to gain any accurate information of even the chances for grass and water from either white man or Indian, the erratic wanderings of the latter having scarcely reached a days march from their own wick-e-ups.

The preliminary map of the 1871 expedition (Nell 1872) was a significant advance in the geographic knowledge of the area, for although only half as detailed as the preceding map (this map is at a scale of 1 inch to 24 miles), the general distribution of mountains and valleys is accurate enough to follow in on modern topographic maps due to the large number of triangulations and astronomic observations made by the survey. These observations, fortunately, covered a wide swath of country surrounding the main route of travel.

The main product of the Wheeler Survey was to be a complete topographic atlas west of the 100th meridian at a scale of 1 inch to 8 miles. Although this project was never completed, atlas sheets (numbers 58 and 66) were prepared for the study area (Wheeler n.d.). On this map Tikaboo Valley is called Tim-pah-ute Valley, Sand Spring Valley is called Penoyer Valley, and a Disappointment Spring is located at the north end of Groom Lake on the plotted route called "First Route Death Valley". Unfortunately, the atlas was never widely distributed, and its potential usefulness never realized by the general public. With the creation of the U.S. Geological Survey in 1879, the achievements of the Wheeler Survey were forgotten (Bartlett 1962:374).

General Land Office Cadastral Survey 1881

Due to the relatively unused nature of the project area and its isolation, it has never been cadastrally surveyed except along its extreme north boundary, between townships 4 and 5 south. The region just north of the study area was partially surveyed in 1869, and the job completed in 1881. The reason for survey of this area was the existence of the Timpahute Mining District, which was much more active than the Groom District. The 1881 survey plats are valuable in this study primarily for documenting the contemporary transportation network and will be discussed later in that context.

Death Valley Expedition 1891

In 1891 the U.S. Department of Agriculture expedition to study the flora and fauna of the Mojave Desert passed through Tikaboo (called Tempiute) and Emigrant Valleys and crossed Summit Spring and Hungry Hill Summit (Merriam 1893:303, 368, 382). This expedition compiled the first detailed flora of the southern portion of the project area, the flora of which was not again studied in detail until the late 1950's, notably by Beatley (1976:106). Sphaeralcea was noted as a principal plant in Tikaboo Valley. Plants noted in the high country near Summit Spring and Hungry Hill Summit include Berberus, Purshia, Coleogyne, Cowania, and Fallugia (Merriam 1893:289, 292, 303-306).

Mining

The Groom Range may have been prospected between 1849 and 1860, but the records of this activity are very poor (Long 1950:110-111). A crude smelter may have been on the Groom Mine property in 1866 (Averett 1963:49). Most prospecting of the area was probably the result of the spread of prospectors from the nearby Pahranagat District, which was discovered in 1865 and declining by 1867 (Roske and Planzo 1978:11). The Groom District was organized in 1869 in time to be mapped by the initial Wheeler reconnaissance (Hamel 1869). By the time G.K. Gilbert visited the district in 1871 about $7000 had been expended on the mines, which were developed to a depth of 50 feet (Wheeler 1872:45). The main claims at Groom, consisting of the White Lake & Conception Lode and the White Lake No. 2 & Conception No. 2 Lode, were patented in 1872.

Only a small amount of unrecorded production occurred in the years before 1875. This was largely due to the long distance the low grade bullion had to be hauled to the Central Pacific. With the building of a railroad to Eureka, shortening the haul to 200 miles, it was hoped that the mines could be worked at a profit (TE 12-16-1874 2:5). By the spring of 1875, two one-hundred foot shafts had been sunk and construction of a furnace was being planned. Prospects were good enough to excite the interest of the British Mill and Mining Company in the district (TE 5-11-1875 2:4). In June materials were on the way to Groom to build furnaces and a town site called Naquinta was planned. The mines were under the management of J.B. Osborne, and the press of Pioche was making a bid for making Pioche the supply center for the district instead of Eureka (PR 6-5-1875 3:1; 7-4-1875 3:1).

In September, 1875, there were thirty men employed in the district working the mines and improving roads. Work was speeded by the recent acquisition of a Burley compressed air drill (PR 9-5-1875 3:1). Machinery and timbers from the Phoenix Mining company of Pioche was hauled to the district by oxen drawn wagons (PR 9-18-1875 3:2, 9-26-1875 3:2). A weekly stage from Pioche to Groom was contemplated in October. The trial run from Groom to Pioche took two and a half days (PR 10-17-1875 3:3). Fifty men were at work in December, thirty of which were employed stockpiling logs for processing by the nearly completed sawmill (PR 12-5-1875 3:2). In January, 1876, the relocation of the Phoenix works was completed and the mines had reached a depth of 140 feet. Also, the sawmill was completed and producing 20,000 board feet of lumber per day (PR 1-14-1876 3:1; 1-28-1876 3:2).

The miniature boom of 1875-76 was caused primarily by the introduction of British capital (The date of the boom is derived here from newspaper accounts. Humphrey (1945:35) states, "John Taylor and Co., an English Concern, bonded the property in 1872, and after spending about $80,000 on roads and development work abandoned it as being too isolated"). Groom was only a minor example of a widespread movement of British investments into Nevada during the 1870's (Jackson 1963:218-219). This boom was brought to a close before any real production could take place. In May, 1876, the district was brought to a standstill by a legal conflict between Osborne and the British investors. To make matters worse, a storm wrecked the sawmill, and considerable damage was done to the mill and several houses (TE 5-5-1876 2:4). The legal status of the mines becomes somewhat confused, but by October the mines were once again working, and in November the English Company had bought out the interests of Osborne and had sent 5,000 pounds to continue operations (PR 10-1-1876 3:2; 11-11-1876 3:2; 11-29-1876 3:2).

The entire state of Nevada was in a severe economic depression between 1880 and 1900 (Elliott 1973:170-171). The Groom District was no exception; there was essentially no activity except for exchanges of claims from 1877 through 1905 (Angel 1881:485; PR 2-1-1900 1:1; 3-10-1905 4:2). The only hope for a renewal of activity in the district was the construction of a railroad within a reasonable distance. This long awaited event happened in 1905, with the completion of the San Pedro, Los Angeles and Salt Lake Railroad (Myrick 1963:646-647). The nearest connection with this railroad was Caliente, about 80 miles from Groom. In 1906, the importance of the potential Caliente connection was much reduced by the completion of the Las Vegas and Tonopah Railroad (Myrick 1963:466). The nearest stop on this railroad, Indian Springs, was about 60 miles from the district, and the road was much easier, having to cross only one small divide compared with the four between Groom and Caliente.

From 1910 to 1925 ore was hauled to the LV&T at Indian Springs using trucks and, starting in 1916, a caterpillar pulled ore-train with six trailers totaling 35 tons of ore (Averett 1963:49; LVA 3-11-1916 1:1; 9-30-1916 1:6; 7-13-1918 1:3). The property was owned by Patrick Sheahan and partners since 1885, and was leased to Tom McCormick for two years starting in 1915. The mine was operated by the owners, T.J. Osborne, Patrick Sheahan, and G. Poncin, in 1917 (LVA 6-30-1917 2:2). Small shipments were made by leasers from 1918 to 1942 when Dan Sheahan bonded the property and formed a partnership with the International Mining Corporation of New York (Humphrey 1945:35). The population of the camp in 1918 was between 35 and 40 with a normal work force of more than 16 men (LVA 7-13-1918 1:3) The mine produced steadily from 1942 to 1956. Total recorded production in lead, silver, copper, zinc, and gold for the district is $935,000, nearly all of which came from the Groom Mine (Tschanz and Pampeyan 1970:148, Table 17; Couch and Carpenter 1943:84; Lincoln 1923:121).

Several other areas of recorded mining activity occur in the range. The Black Medal (Metal) Mine, just south of the Groom Mine, was located in 1917. A 110 foot incline is on this property (Humphrey 1945:45). The mine was operated by Ed Lane (Lean) until 1955. The Sheahans have owned the property since 1963 (Sheahan and Sheahan 1985).

Just over three miles northwest of the Groom Mine is the Hanus prospect or Kahama Claim Group. A limited amount of unrecorded gold production has taken place. Most activity has taken place from the late twenties to the early thirties (DEIS 1985:3-34). Charles P. Hanus did most of the location work and early mining. In the early thirties, the property was also occupied by his wife, daughter, and son-in-law (LVRJ 2-23-1933 1:8).

A series of small prospects occur near Cattle Spring, including the Gold Butte and Jumbo claim which were staked in 1933. In addition, most of the larger drainages in the area were worked with dry washers. A limited amount of Gold was recovered from these workings (Humphrey 1945:47; DEIS 1985:3-34; LVRJ 2-23-1933 1:8).

In 1919, mercury was discovered at the Andies property on the northeastern tip of the Groom Range and a new mining district, Don Dale, was organized in this area in 1945. Small amounts of lead, silver, and mercury have been produced DEIS 1985:3-31).

The mining district of Tem-piute suffered from a lack of nearby water sources (Paher 1970:303). So severe was this problem that mill sites for Tem-piute ore were located in the Groom Range at Savio and Water Tank Springs in 1878 and 1872 respectively (Quade and Tingley 1985:14-17). Neither of these sites was ever developed for milling purposes.

Mineralogy and technical details concerning mining in the Groom Range are covered in detail in the Groom Range Draft Environmental Impact Statement (1985) and in a mineral report by Quade and Tingley (1985).

Ranching

Large areas of Nye and western Lincoln Counties were totally ungrazed throughout most of the nineteenth century due to the scant vegetation, low rainfall, and high temperatures (Short 1965:37). The closest significant agricultural area was the Pahranagat Valley (Venstrom 1932), which, although originally occupied by miners in 1865, soon became the site of large ranches due to the mild winters and abundant water (Short 1965:31; Carpenter 1915 Plate 1). The first farm in upper Pahranagat was settled in 1866 by James Butler. Later that same year many farmers, particularly apostate Mormons, started moving into the area. Alamo was settled in 1901 by Mormon families including the Stewarts, Frehners, and Lambs after purchase of the Pierson Ranch (Vincent 1976:27; Bourne 1973:69). The Stewarts were prominent in grazing cattle on the Groom Range. Ranching in the valleys bordering the Groom Range did not begin until the 1890's. An accurate indication of the lack of interest in the project area is shown by the late date of water filings in the Groom Range, which were made by J.R.

Moser for D.A. Enterprise, Alamo, Nevada in 1897 and 1898. Expected use of each spring ranged from fifteen to one-hundred cattle. A ground water map of southern Nevada prepared in 1915 (Carpenter 1915 Plate 1), which covers potential agricultural areas in detail, surrounds the project area on three sides, yet leaves it blank.

By the late nineteenth century the problems of unrestricted grazing had become obvious as the cattle and sheep industries suffered disasters related to overgrazing the land, often by itinerant herds and flocks. The Forest Service was the only agency which was able to regulate range use early in the twentieth century (Hays 1974:55-59). In central Nevada, several ranges were administered by the Forest Service due to local ranching industry pressure for regulated range use (Crane 1984:11; Townley 1982:96,97). Such pressures, however, were not brought to bear on the little-used Groom Range. Drought, poor forage, and low livestock prices, including a 50 percent drop between 1931 and 1933, led to passage of the Taylor Grazing Act in 1934 (Shane 1984). This act extended to the U.S. Department of the Interior the same authority to administer grazing on public lands that the Forest Service had in the National Forests. In 1935, grazing districts were established for most of Nevada. Significantly, the one large area that was not incorporated into a district was about 20,000,000 acres in Central Nevada, including the project area (Buckman 1935:1-5; 1937:72-73).

Grazing allotments (Naquinta Springs Allotment on the west and Bald Mountain Allotment on the east slope of the range) were finally established in the Groom Range in 1944. The only use of the area has been for livestock grazing, which has been on a limited scale due to lack of water.

No self sufficient ranches were ever located in the project area. A line shack, corral, and fence complex located near Cattle Spring is the most intensively occupied ranching complex in the project area.

Government Reservations*

President Franklin D. Roosevelt established the Desert Game Range in 1936 by Executive Order No. 7373 for the protection and preservation of the resident populations desert bighorn sheep. On October 29, 1940, President Roosevelt by E.O. 8578 established the Las Vegas Bombing and Gunnery Range (now called Nellis AF Range). Since that date, the range has been the subject of two additional E.O.'s, nine Public Land Orders, two Memorandums of Understanding (MOU's) and one Public Law. Withdrawn land of Indian Springs Auxiliary Airfield (AAF) dates back to November 12, 1942 when PLO-58 designated 25,294 acres of public land for military use. Since that time three other PLOs were enacted to provide a total of only 2,082 acres of public land for Indian Springs AAF.

From the initial date of Nellis AF Range until 1959, co-use was granted to cattlemen and miners. Between 1959 and 1965, under the authority of the Air Force Real Estate Directive 592.2, dated September 21, 1954, all grazing and virtually all mineral rights within the Range were extinguished through purchase by the Air Force.

*Derived from the Groom Mountain Range DEIS (1985:1-3).

In order to provide for the protection of bighorn sheep and wild horses, the Air Force, Fish and Wildlife Service, and Bureau of Land Management entered into MOUs in June 1951 and June 1962. Those MOUs have been updated and amended as necessary to assure proper management by the respective agencies.

Public Land Orders 805, 1382, and 2568 transferred portions of the Nellis AF Range to the Atomic Energy Commission (now DOE) for the development of the Nevada Test Site (NTS) located between the north and south portion of the Nellis AF Range. The Air Force, through an MOU, permitted 369,280 acres in November, 1956 to DOE for utilization as a fully instrumented ballistic test range. This area is referred to as the Tonopah Test Range.

The Air Force's Tactical Fighter Weapons Center (TFWC) located at Nellis Air Force Base in Nevada has been assigned the mission of operationally testing and evaluating new weapons systems, and permitting aircrew combat training, under conditions that simulate, as nearly as possible, an actual enemy scenario. TFWC is the command organization for Nellis AFB and functions directly under the Commander, Tactical Air Command. Subordinate units of the TFWC which are responsible for conducting TFWC range operations are the 57th Tactical Training Wing (TTW), the 440th Tactical Fighter Training Group (TFTG), and the TFWC Range Group.

Range maintenance and support for the Department of Energy (DOE) is provided by Indian springs Auxiliary Air Field (AAF). The 57th Combat Support Squadron (CSS) is under the command of the 57th TTW at Nellis AFB.

Previous Archaeological Research

A literature search was conducted for site and survey information within the four 15' quadrangles surrounding the project area (U.S.G.S. White Blotch Spring, Tempiute Mtn., Groom Mine, and the northwest quarter of BLM Emigrant Valley). Previous archaeological surveys within this area are plotted on Figure 2-23. All documented archaeological research near the project area has been the result of cultural resources management related projects. The first of these projects was a pipeline survey from the vicinity of Tempiute Mine northwest to Burdicks Well. No evidence of historic or prehistoric remains was found (Jacobs 1975).

A powerline right-of-way from Delamar to Tempiute was surveyed in 1976. The entire corridor was not subjected to a pedestrian survey. Instead, it was driven and periodically spot checked on foot. Only three sites were found in the portion of the survey within the scope of this review. Site 26Ln1571 is an isolated Gypsum Series chalcedony projectile point located at the base of a rock outcrop at the northern end of Tikaboo Valley. Site 26Ln1572 is a small rockshelter containing lithic debitage located on the southeast face of the Tempahute Range. Site 26Ln1573 is another rockshelter containing lithic debitage and probably a wall located at the base of the west face of the Tempahute Range overlooking a dry wash which runs into Sand Spring Valley (Hatoff 1976). Four material pits with a total area of 200 acres were also surveyed in the vicinity of Tempiute Mountain in 1976. None of these locations contained any cultural resources (Wirtz 1976a,b,c,d).

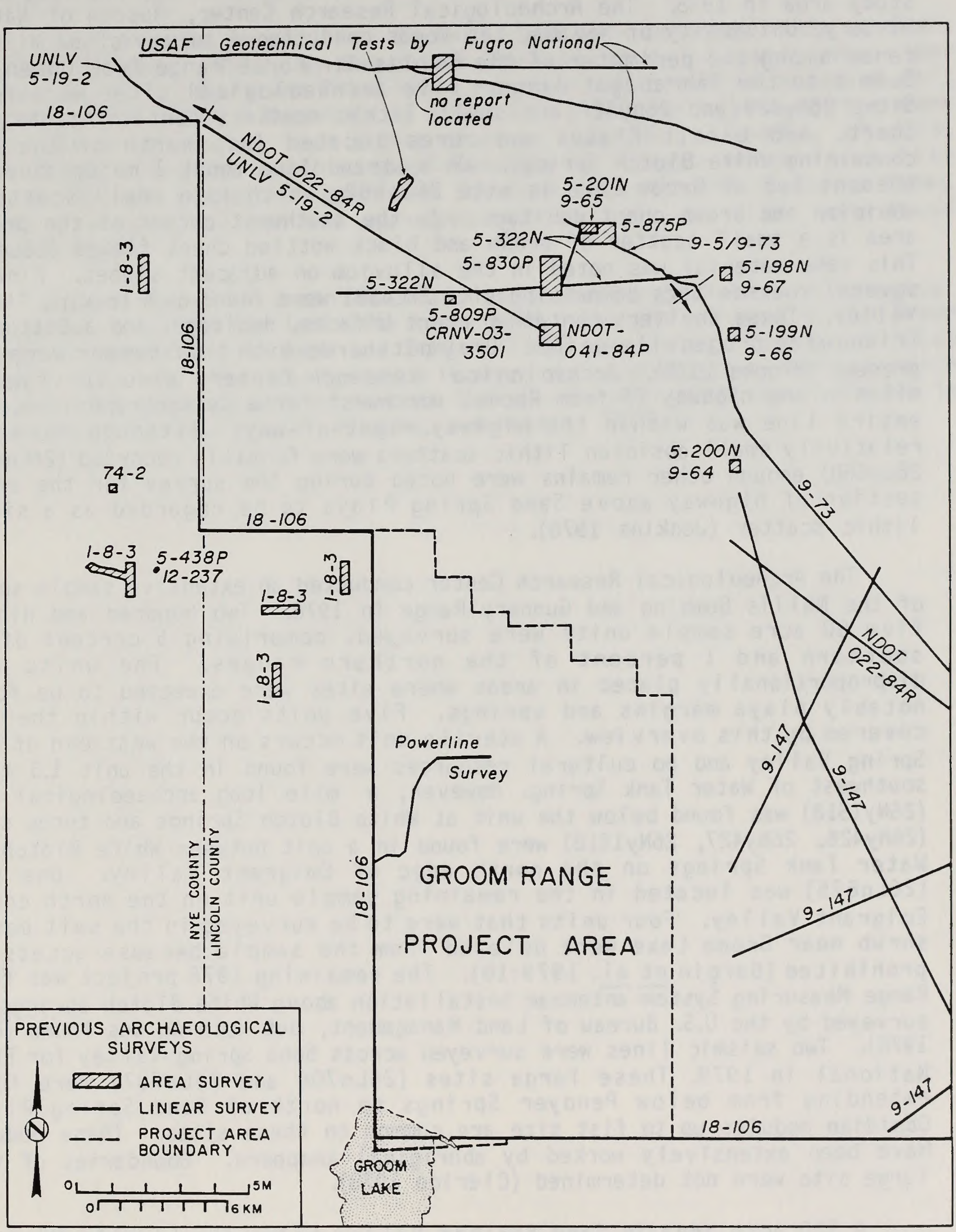

Figure 2-23: Previous archaeological surveys in the vicinity of the Groom Range, Lincoln County, Nevada.

A powerline right-of-way was surveyed from Penoyer Farms in Sand Spring Valley to the Lincoln Mine in the Tempiute Range. No cultural resources were found (Hougland 1977).

Several archaeological projects were undertaken in the vicinity of the study area in 1978. The Archeological Research Center, Museum of Natural History, University of Nevada, Las Vegas conducted a survey of 62 miles of fence along the perimeter of the Nellis Air Force Range from Queen City Summit to the Pahranagat Range. Five archaeological sites were found. Sites 26Ny426 and 26Ny427 are small lithic scatters containing obsidian, chert, and basalt flakes and cores located just north of the hill containing White Blotch Springs. On a strand line about 1 meter above the present bed of Groom Lake is site 26Ln662, which is a small scatter of obsidian and brown chert debitage. In the southwest corner of the project area is a small scatter of brown and black mottled chert flakes (26Ln663). This same material was noted in the alluvium on adjacent slopes. Finally, several rockshelters comprising site 26Ln661 were found overlooking Tikaboo Valley. These shelters contained chert bifaces, debitage, and a Cottonwood Triangular projectile point. Gray potsherds with tuff temper were also present (Brooks 1978). Archeological Research Center, also surveyed 8.2 miles along highway 25 from Rachel northwest for a seismograph line. The entire line was within the highway right-of-way. Although only four relatively small obsidian lithic scatters were formally recorded (26Ln657 - 26Ln660) enough other remains were noted during the survey for the entire section of highway above Sand Spring Playa to be regarded as a single lithic scatter (Jenkins 1978).

The Archeological Research Center conducted an extensive sample survey of the Nellis Bombing and Gunnery Range in 1978. Two hundred and ninety-five 80 acre sample units were surveyed, comprising 5 percent of the southern and 1 percent of the northern ranges. The units were disproportionally placed in areas where sites were expected to be found, notably playa margins and springs. Five units occur within the area covered by this overview. A sterile unit occurs on the west end of Sand Spring Valley and no cultural resources were found in the unit 1.3 miles southwest of Water Tank Spring. However, a mile long archaeological site (26Ny1518) was found below the unit at White Blotch Springs and three sites (26Ny426, 26Ny427, 26Ny1518) were found in a unit between White Blotch and Water Tank Springs on the north edge of Emigrant Valley. One site (26Ln675) was located in the remaining sample unit on the north end of Emigrant Valley. Four units that were to be surveyed in the salt desert shrub near Groom Lake were deleted from the sample because access was prohibited (Bergin et al. 1979:10). The remaining 1978 project was for a Range Measuring System antennae installation above White Blotch Springs was surveyed by the U.S. Bureau of Land Management, but nothing was found (Rolf 1978). Two seismic lines were surveyed across Sand Spring Valley for Fugro National in 1979. These large sites (26Ln706 and 26Ln707) were found extending from below Penoyer Springs to north of Sand Spring Playa. Obsidian nodules up to fist size are common on these sites. These nodules have been extensively worked by aboriginal knappers. Boundaries of this large site were not determined (Clerico 1978).

A 320 acre area in Sand Springs Valley below the Lincoln Mine was surveyed for clearance of the Tempiute Mine Road overlay. Three prehistoric rockshelters, two lithic scatters, and a mining area were located. The only diagnostic prehistoric artifact found was a triangular projectile point base (Steinberg 1980). An additional 320 acre area 1 mile southwest of the project was surveyed for the Tempiute Mine Road E.A.. A light lithic scatter and an isolate were recorded during this latter survey.

Five Seisdata Service Inc. seismic lines were surveyed in the northern end of Tikaboo Valley by Sagebrush Archaeological Consultants. One opportunistic quarry and 7 isolates were recorded in 54.39 miles of this survey (Polk 1984). A survey of State Route 375 for highway betterment recorded an additional four lithic scatters (26Ln3017, 27Ln3018, 27Ln3019, 26Ln3020) along the south side of Sand Spring Playa. An obsidian Elko Corner Notched projectile point was found at site 26Ln3018 (Peterson 1984). A 40 acre material pit was surveyed near Rachel. No sites were found (Bunch 1984).

Desert Research Institute has conducted large scale archaeological projects on the Nevada Test Site since 1978. The nearest work to the Groom Range is summarized in Reno and Pippin (1985) concerning a survey of Yucca Flat. DRI has also conducted a survey of southeastern Nevada which involved field work east of Hancock Summit. Several sites were recorded in Pahranagat Valley (Fowler, Madsen, and Hattori 1973).

3. FIELD METHODS

Field methods used on this project were selected on the basis of the sampling design, the nature of the cultural resources we anticipated encountering during the survey, the local environment (including such factors as steep terrain and ground visibility), and appropriate data recovery techniques consonant with time constraints and current archaeological practice. These methods, and the rationale for their implementation, are discussed below.

Sample Design
by Stephen R. Durand

It recently has been argued that the appropriate universe to sample in a cultural resource management context is space (Dunnell 1984). The argument is based on the premise that in a CRM context, one is charged with more than answering a narrow research question. Though research questions are an important component of CRM, one must also obtain a "representative" sample of all of the empirical data that one has access to, bearing in mind the current state of the art in archaeological data recovery and efficiency considerations. By basing a sampling design on a research question (or series of questions) one has biased the sample in terms of those questions and important information might be overlooked. This perspective is also the most parsimonious in that one has assumed nothing about artifacts and features except that they are distributed in space.

How does one adequately sample space? Since the early 1960's, most archaeologists have agreed that a "representative" sample is one that is derived in accordance with statistical sampling theory (Binford 1964; Cowgill 1964; and others). However, as well recognized by political polsters, in order to be the most sensitive and reliable, a sampling design should be based on known characteristics of the sampling universe. Hence, the problem of sampling space on the Groom Range is answered by drawing a sample based on statistical sampling theory and our prior knowledge of the spatial universe we are sampling.

Initial Considerations

Vegetation zones on the Groom Range are distributed in patterned, non random way (Figure 2-13). This observation indicates that a systematic sample of the region may not be an adequate sample. If one samples systematically at a given interval, one might entirely miss certain variation in the environment if that variation is also distributed in a similar, systematic fashion. Therefore, the method for deriving a sample must have a random component in order to avoid missing uniformly spaced environmental phenomenon. A random component is also desirable from a theoretical perspective (i.e. sampling theory).

Though it might be argued that a simple random sample is adequate to characterize the region in a statistical sense, the environmental variation in the region suggests that it is desirable to have a dispersed sample covering the entire space. For example, the Groom Lake playa occurs only in the extreme southwestern portion of the region. The sample then needs to be purposefully biased to sample all of the space present. Finally, the

USAF specified a sample fraction of 6% and a sample unit size of 500m by 500m quadrats.

Sample Selection

A modified random sample was used for this study. Sample squares were chosen at random with the modification that every time a unit was chosen, 24 surrounding 500m squares (2500m on a side) were also eliminated from further consideration. This procedure resulted in selecting sample units that could be no closer than 1000m to each other.

The first step in selecting the sample was to grid the area into 500m squares. The borders were generalized to a regular pattern by eliminating 500m squares if more than half of the unit was outside the boundaries of the project area. This yielded 1433 possible units covering 358.25 km^2. The actual area of the project area is slightly larger at 362.75 km^2. A 6% sample required that we select 86 sample units.

The computational procedure for selecting the units was written in BASIC and consists of the following steps:

1) select a random X coordinate and a random Y coordinate.

2) test for unit validity. (i.e. has it been selected?)

3) if valid (step 2), then output coordinates and invalidate the unit and surrounding units.

4) if less than 86 units go to step 1.

Coordinates of sample unit center points are shown in Table 3-1.

Discussion

The procedure used to generate the sample produced the desired result, a dispersed sample. This is apparent visually (Figure 3-1). In applying this procedure to other areas one should base the number of units eliminated after a sample unit is selected (step 3) on the sample size and fraction. With a smaller sample fraction, the number of units eliminated would be increased and conversely, with a larger sample fraction, the number of units eliminated should be decreased.

Table 3-1: UTM Coordinates of sample unit centers for Groom Range Archaeological Reconnaissance.

Unit	East	North	Unit	East	North
1	605,750	4,156,250	45	609,750	4,138,250
2	608,250	4,155,250	46	612,750	4,138,250
3	607,750	4,153,750	47	616,750	4,138,250
4	606,250	4,153,250	48	611,250	4,137,750
5	609,250	4,153,250	49	607,250	4,137,250
6	606,250	4,151,250	50	613,250	4,136,750
7	610,250	4,151,250	51	616,750	4,136,750
8	612,250	4,150,250	52	614,750	4,136,250
9	614,750	4,150,250	53	618,250	4,136,250
10	607,250	4,149,750	54	608,250	4,135,750
11	608,750	4,149,750	55	609,750	4,135,750
12	617,750	4,149,250	56	619,750	4,135,750
13	612,250	4,148,750	57	612,750	4,134,750
14	615,250	4,148,750	58	616,750	4,134,750
15	613,750	4,147,750	59	605,750	4,134,250
16	618,750	4,147,750	60	609,250	4,134,250
17	607,250	4,147,250	61	618,250	4,134,250
18	609,250	4,147,250	62	610,750	4,133,750
19	611,750	4,146,750	63	619,750	4,133,750
20	615,250	4,146,750	64	613,750	4,133,250
21	617,250	4,146,750	65	607,250	4,132,750
22	618,750	4,146,250	66	615,750	4,132,750
23	606,250	4,145,750	67	610,250	4,132,250
24	607,750	4,145,750	68	611,750	4,132,250
25	609,250	4,145,250	69	619,750	4,132,250
26	613,750	4,145,250	70	618,250	4,131,750
27	619,750	4,144,750	71	608,250	4,131,250
28	615,750	4,144,250	72	615,250	4,131,250
29	617,250	4,144,250	73	606,750	4,130,750
30	611.750	4,143,750	74	609,750	4,130,750
31	607,750	4,143,250	75	612,250	4,130,750
32	619,250	4,143,250	76	618,750	4,130,250
33	609,250	4,142,750	77	615,250	4,129,750
34	617,750	4,142,750	78	609,750	4,129,250
35	611,250	4,142,250	79	607,750	4,128,750
36	613,250	4,142,250	80	612,250	4,128,750
37	615,750	4,142,250	81	618,250	4,128,750
38	619,250	4,141,750	82	613,750	4,127,750
39	609,250	4,141,250	83	615,250	4,127,750
40	607,250	4,140,750	84	616,750	4,127,750
41	614,750	4,140,250	85	606,750	4,127,250
42	617,250	4,140,250	86	609,250	4,127,250
43	619,250	4,139,250			
44	605,750	4,138,250			

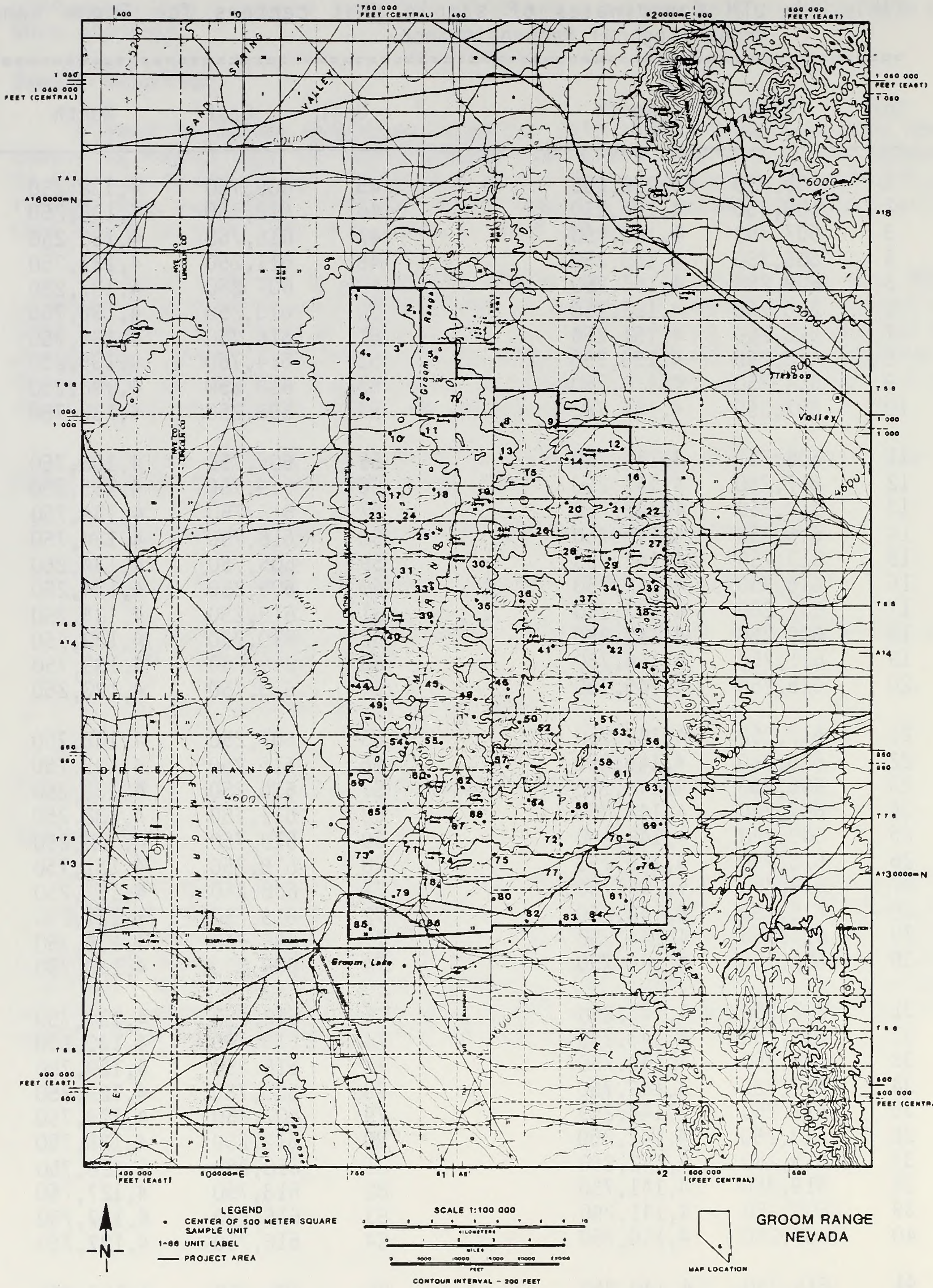

Figure 3-1: Sample unit locations in the Groom Range, Lincoln County, Nevada.

Survey Techniques

Field work was based at a camp located at the East Gate. Vehicles were used to access most sample quadrats, but several of the more remote units were reached by helicopter. Virtually all driving was on existing roads.

The center point of each sample quadrat presented in Table 3-1 was plotted on both available topographic maps and areal photographs. Due to the rugged nature of the terrain and a desire to make the boundaries of units as re-locatable as possible, the field crews were allowed to shift the orientation and position of the quadrat around this center point. This same system of shifting quadrats was effectively used in a recent survey of the Mormon Mountains (Rusco and Munoz 1983:17). This policy also enabled a more efficient coverage of topography since boundaries could be oriented along the same axis as the drainage systems, ridges, etc. The following constraints were observed while making field decisions concerning shifting quadrats.

1) The original center point must remain within the quadrat.

2) Unit location and North-South, East-West orientation should be shifted as little as possible while trying to find a fit between quadrat and topography.

3) Quadrats should not be shifted with the purpose of decreasing the distance that needs to be traveled to gain access.

4) Quadrats should not be shifted for the purpose of covering areas that appear to be more likely to contain cultural remains or avoiding areas felt to be devoid of sites.

Quadrat centers were plotted on 1:62,500 scale topographic maps and on 1:24,000 scale orthophotoquads. Unfortunately, orthophotoquads were available only for the eastern half of the project area. These provided an ideal intermediate step between the contour maps and the 1:24,000 scale air photos that were used for all field plotting. Hence, whenever possible, quadrat boundaries were plotted on the orthophoto after observing the topography in the vicinity of the sample quadrat. The unit boundaries could then be transferred to the air photo by referring to topography on both photos. Due to parallax, the sample units drawn on the orthophotos often became different sized trapezoids when plotted on the air photos. Since we lacked the orthophotos for the western portion of the project area, squares at 1:24,000 scale were drawn on the air photos, decreasing the accuracy of sample unit boundaries. In the rugged terrain, topography alone served to mark edges of quadrats, but in areas lacking significant relief quadrat boundaries were established by compass and lines of flagging tape.

The basic interval between transects was 30 meters, or 16 transects per sample quadrat. Transects were oriented parallel to one of the quadrat axes whenever possible; however, this scheme had to be modified in rugged terrain where transects were contoured to match topography. Crews were not expected to systematically traverse exceptionally steep (40°) unstable slopes, but areas on those slopes such as benches, ridge tops, cliff bands, etc. were consistently walked.

Following the main survey, the Air Force requested that DRI perform a 100 percent reconnaissance of a powerline and access road from Cattle Spring to Mount Baldy to assess the impact of that prior construction. Two 30m wide transects were walked on each side of the existing powerline and sites were recorded in the same fashion as for the main survey. Results of the powerline survey are included in this report (Figure 5-1, Table 5-1, Table 5-4).

Recording and Collection Procedures

Before starting fieldwork, a manual of site form encoding instructions was prepared to help insure that data collected by fieldworkers would be as comparable as possible. Quadrat and vegetation forms summarizing environmental and cultural data were completed for each sample unit. Site forms were filled out for each archaeological site found within the sample quadrats. Recording of sites encountered outside of the sample units was optional and the level of recording varied depending on time constraints. Sites were plotted on the air photos with a pinprick and the site number on the reverse side. Boundaries of large sites were drawn directly on the air photos with a felt tip technical pen.

Once recorded, all sites were marked with aluminum tags bearing the site number. This tag was placed in an obvious and fairly permanent location. Diagnostic artifacts, including projectile points and a sample of each kind of pottery present on a site, but usually not historic artifacts were collected. Toolstone samples and a sample of obsidian flakes were also collected for sourcing studies. The discovery spot of each collected artifact was marked with a large nail and an aluminum tag bearing the site and reference numbers.

Black and white photographs were taken of each sample quadrat. Photographs were also taken of archaeological sites with features prominent enough to be visible on film. As many non-debitage artifacts were photographed in the field as time permitted. These artifacts were photographed on a graph paper background showing the site number.

Field Laboratory Procedures

Map plots were transferred from air photos to orthophotoquads where applicable and then transferred to 1:62,500 maps. Completed forms were then filed in the appropriate notebooks after proofreading by the crew chief. Collected artifacts and samples were placed in a central repository and entered in a field catalog.

Laboratory Methods and Procedures

All artifacts collected during the survey of the Groom Range were returned to the Desert Research Institute in Reno where they were numbered, catalogued and analyzed. Each artifact was assigned a unique artifact number consisting of the site number, a reference number coding the artifact's provenience, and a sequential specimen number for all artifacts from that provenience.

Cataloging of artifacts included coding onto computer coding sheets. The coding format describes artifacts by site and provenience, material type, condition, and artifact type. Weights and measurements were taken on all complete artifacts other than debitage and shatter. During computer coding, however, debitage was classified according to flake types (decortication, primary core reduction, biface thinning, shatter and indeterminate).

Microscope examination of artifacts and artifact edges was accomplished using a Nikon SMZ-10 Sterozoom (6x-40x) microscope with a MKII fiber optic, halogen light source. Artifact photographs were taken using an Olympus OM-1n, 35 mm camera with 50 mm lens and Polaroid filter, a glass covered fluorescent light box, and low angle illumination.

Summary of Work Effort

Field work was accomplished in four ten-day sessions between May 3 and June 23. The work force consisted of three independent, two person crews for the entire project with the exception of June 22 when two crews were in the field and June 23 when only one crew was working. In addition, the Principal Investigator was in the field for a portion (5 days each session) of the first three sessions. Field work on the powerline was completed on October 4 and 5, 1985 by a two person crew, including the Principal Investigator.

Of the 234 person days in the field, 48 were used for travel and logistics such as camp maintenance and 11 days were lost due to Air Force activities, leaving a total of 175 work days. An average of 2.03 person days were expended per sample unit.

4. MATERIAL CULTURE ANALYSIS

Theoretical Orientations

by L.C. Pippin

Artifact collection during this survey was very limited and consisted only of projectile points, potsherds, and unusual artifacts which defied field identification. Thus, most of the artifact analysis was done in the field. This analysis consisted of tabulating artifacts in types according to the definitions presented below. It should be stressed that detailed analyses were not undertaken, and some field identifications might be subject to error.

Artifact Production Trajectories

Figure 4-1 presents an idealized flow diagram for the stages of stone tool manufacture and use (Pippin and Hattori 1980, fig. 1). This model provides the framework used for the classification of artifacts from the Groom Range. Several basic principles of stone tool manufacture and use are represented. First, it should be emphasized that any stage of artifact manufacture may represent a "finished tool." For example, primary flakes with unmodified working edges may be more efficient for certain tasks than those carefully prepared by retouching (Gould, Koster and Sontz 1971:152, 156; Walker 1978). Concomitantly, worn working edges may have been resharpened or rejuvenated several times before the tool was discarded into the archaeological record.

The second principle reflected in Figure 4-1 is that artifacts recovered in the archaeological record may represent a variety of "unfinished" or "rejected" tools or byproducts of tool manufacture (Holmes 1890:11-13). Through the isolation of ancient techniques and methods represented in each stage of lithic tool production, researchers may accurately characterize ancient patterns of lithic technology, as well as provide data pertinent to interpretations of site function and significance (Bucy 1974; Collins 1975; Muto 1971a,b; Sharrock 1966; Womack 1977). In addition, if differences in production techniques represented in the archaeological record can be separated, possible technological chronological, and/or functional information may be revealed and defined for a particular stage form. The strategies of tool manufacture and use also may be expected to vary according to several other factors. Among these are (1) the spatial locations of tool stone in relationship to the spatial locations of resources or tasks for which the tools were used; (2) the suitability of available toolstone for technological and task-specific functions; and (3) the overall strategy of seasonal human population movement and resource exploitation in the region (Chapman 1977:372-374).

Functional Analyses

The functional analysis of material culture from the project area was directed toward the delineation of artifact assemblages which might be associated with past resource procurement and processing systems. For example, artifact assemblages that resulted from hunting and/or butchering activities might be typified by artifacts (millingstones, manos, baskets, etc.) discarded or lost during seen procurement (Bettinger 1975:69-99).

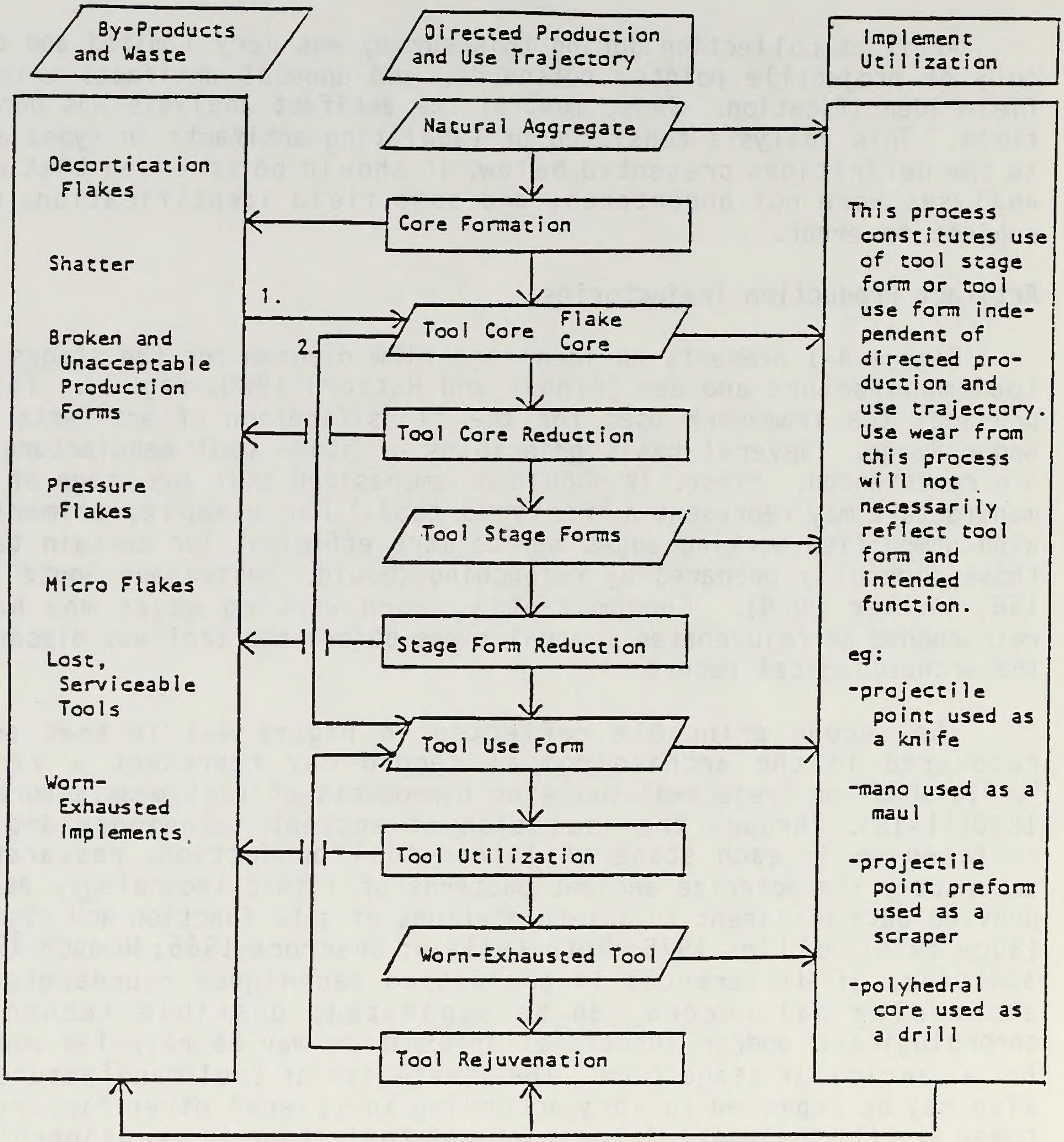

Figure 4-1: Generalized flow diagram for chipped stone tool manufacture and use. (From Pippin and Hattori 1980, fig. 1).

1. "Waste products" or "debitage" from most stages can reenter the directed trajectory as a tool core for other tool forms or modified versions of original tool forms.

2. Unmodified forms can be selected and enter a directed trajectory without modification.

Here, it is important to heed Jelinek's (1976:31) warning that the artifacts discarded in the archaeological record were probably viewed as "trash" by the peoples responsible for their deposition. Artifact assemblages do not necessarily reflect complete "tool kits," but rather a restricted, and often biased, sample of only a segment of any particular activity.

Debitage

Residual flakes and shatter produced during the manufacture of lithic tools were the most abundant cultural remains discovered in the Groom Range. Six general flake types were identified in the field using the criteria presented in Table 4-1. Whenever the analyst was not totally confident as to which class a particular flake might belong, or when identifying characteristics were absent due to flake breakage, the flake was assigned to the indeterminate category.

Table 4-1: Definitions of flake type categories used in the analysis of debitage from the Groom Range project area.

Flake Type	Definition
Decortication	Flakes which display more than 25 percent cortex on their dorsal surface.
Shatter	Includes all angular, blocky specimens which do not display identifiable platforms, bulbs of applied force and/or rings of force.
Core Reduction	A relatively thick flake with a flat or cortex covered, but not multifaceted, platform. Previous flake scars may occur along various orientations across the flakes dorsal surface. This flake category includes all flakes which can not be assigned to one of the following flake styles.
Bifacial Thinning	A thin, curved, expanding or lanceolate shaped flake with previous flake scars oriented at various angles across its dorsal flake surface. This flake type should exhibit a bifacial or multifaceted platform, truncated or diffuse bulb of applied force and, usually, a lip formed directly below the platform on the ventral flake surface.
Pressure	A relatively small, lanceolate or expanding shaped flake displaying an acuminate bulb, longitudinal curvature, and dorsal flake scars from the platform; these flakes may exhibit bifacial edge remnants or flat platforms.
Indeterminate	Any flake which due to a lack of features can not be confidently placed in any of the above flake types.

Flakes with cortex on their dorsal surfaces would be produced during the initial preparation and shaping of cores. High frequencies of decortication flakes at a knapping locality are interpreted to signify the early stages of tool manufacture or the assaying of locally available toolstone.

Following decortication, core reduction flakes may be removed from cores either to form tools or flake blanks, or to shape the toolstone piece into a desired configuration. The occurrence of bifacial thinning flakes at archaeological sites signifies the production of bifacially flaked artifacts or flake blanks and tools produced from bifacial cores or stage forms.

The occurrence of pressure flakes in the debitage assemblage from archaeological sites signifies the final shaping and/or resharpening of flaked stone tools. However, because these small flakes are difficult to observe from the archaeological record during survey conditions their actual occurrence on sites in the Groom Range is probably under represented in our database.

Knapping bifacial and other cores also usually produces a varied quantity of residual lithic shatter. This shatter consisted of blocky "chunks" of toolstone with poorly defined platforms, bulbs of applied force and rings of force. This type of debitage is often produced during the initial stages of core shaping using hard hammer fabricators.

Finally, the indeterminate debitage category includes both whole or nearly complete flakes that, due to indecision on the analyst's part, could not be confidently assigned to one of the above categories and flake fragments that did not retain enough characteristics to be confidently assigned to one of the other flake groups. The meaning of this category of debitage is difficult to discern since it measures both the confidence of our typology and the frequency of broken flakes in the debitage sample, but indeterminate flakes tend to be associated with biface thinning.

All debitage samples with 20 or more flakes tabulated in the project were subjected to a cluster analysis using the SYSTAT program (Wilkinsen 1984). The results of this exercise are shown in Figure 4-2 and raw data is summarized in Table 4-2. In general, the ordering produced by this analysis is from the final stages of toolstone manufacture at the top of the diagram toward the beginning stages at the bottom. This relationship is clearly shown in Figure 4-3, where the pattern is late stages of tool production on the left side of the graph progressing toward early production on the right side. Moving from to top to bottom, major clusters are characterized as follows. The first cluster is characterized by high percentages of Biface Thinning and Indeterminate flakes and a small percentage of Shatter. The next cluster still has much Biface Thinning and Indeterminates, but the rest of the assemblage is highly variable. The third cluster is generally mixed. Clusters 4 and 5 are marked by increasing percentages of Decortication and Core Reduction flakes. Site types follow the pattern that would be expected from this interpretation. The first five sites at the top of the tree diagram are all Temporary Camps. Three of the five sites at the bottom of the diagram are quarries, and one is the only knapping station included the analysis, which is the scene of preliminary reduction of a single cobble. The remaining debitage

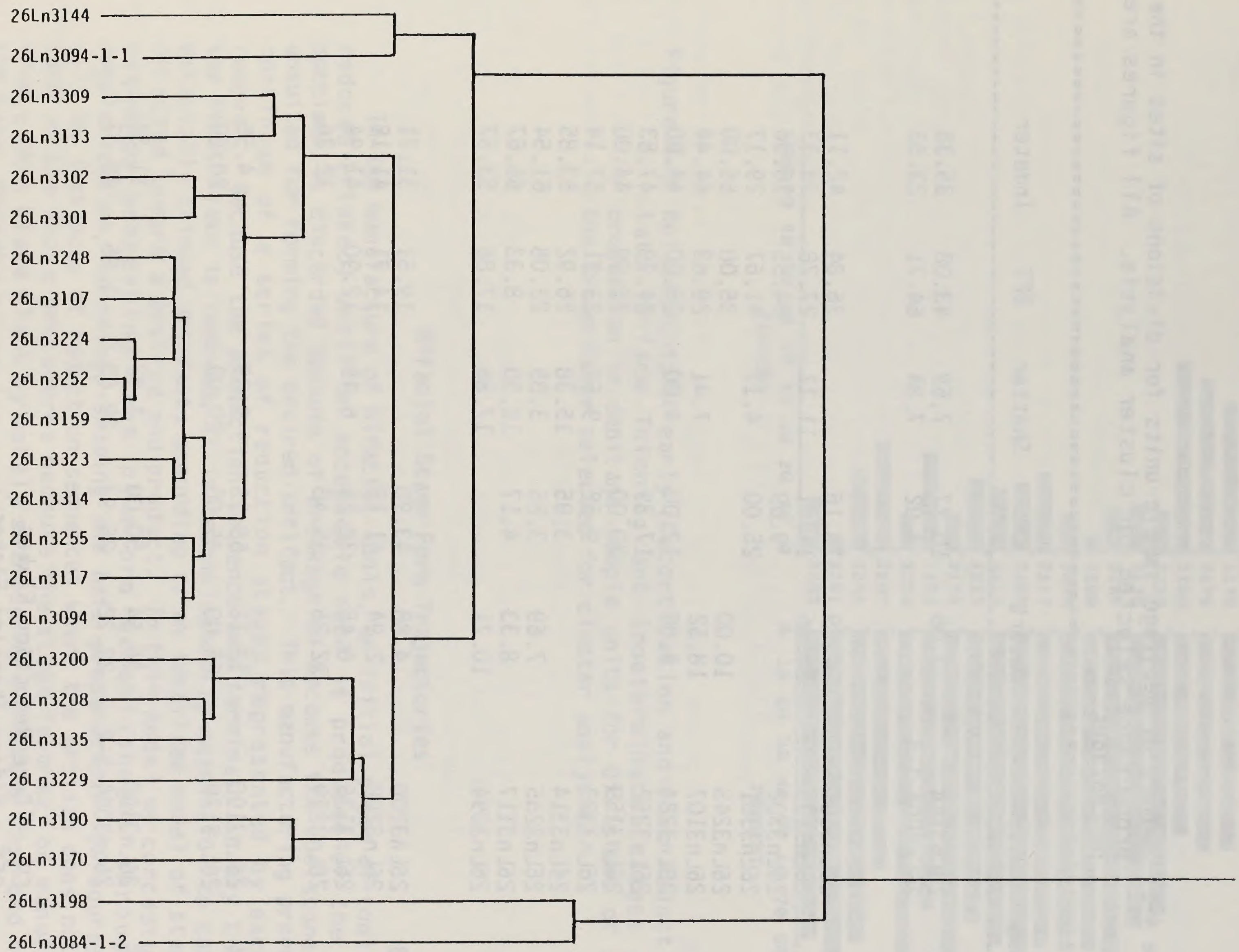

Figure 4-2: Tree diagram for cluster analysis of division of sites in the Groom Range with 20 or more debitage artifacts. Linkage method is nearest neighbor.

sample unit is for a distinct knapping station within a temporary camp which has a more generalized toolkit more in keeping with our model of the activities expected in a camp. The remaining sites are a mix of lithic scatters and temporary camps.

Table 4-2: Summary of debitage sample units for divisions of sites in the Groom Range selected for cluster analysis. All figures are percentages.

Cluster	Site	Decort	CR	Shatter	BFT	Indeter
1	26Ln3144	3.08	10.77	7.69	43.08	35.38
	26Ln3094-1-1		3.92	7.84	64.71	23.53
2	26Ln3309	7.89	13.16		36.84	42.11
	26Ln3133	12.96	14.81	11.11	27.78	33.33
	26Ln3302		9.09		54.55	36.36
	26Ln3301		25.00	4.17	41.67	29.17
	26Ln3248	10.00			35.00	55.00
	26Ln3107	18.52		7.41	29.63	44.44
	26Ln3224	4.00	12.00	4.00	36.00	44.00
	26Ln3252		17.39		34.78	47.83
	26Ln3159		20.00		36.00	44.00
	26Ln3323		9.52	9.52	23.81	57.14
	26Ln3314		3.85	15.38	26.92	53.85
	26Ln3255	7.69	3.85	3.85	23.08	61.54
	26Ln3117	8.33	4.17	12.50	8.33	66.67
	26Ln3094	10.71		17.86	17.86	53.57
3	26Ln3200	4.88	43.90		19.51	31.71
	26Ln3208	2.94	41.18		14.71	41.18
	26Ln3135	6.45	32.26	6.45	12.90	41.94
	26Ln3229	32.26	35.48			32.26
4	26Ln3190	18.18	68.18	9.09		4.55
	26Ln3170	25.00	35.00	20.00		20.00
5	26Ln3198	36.54	50.00	1.92		11.54
	26Ln3084-1-2	22.22	25.93	29.63	1.85	20.37

CR = Core Reduction Flakes
BFT = Biface Thinning Flakes

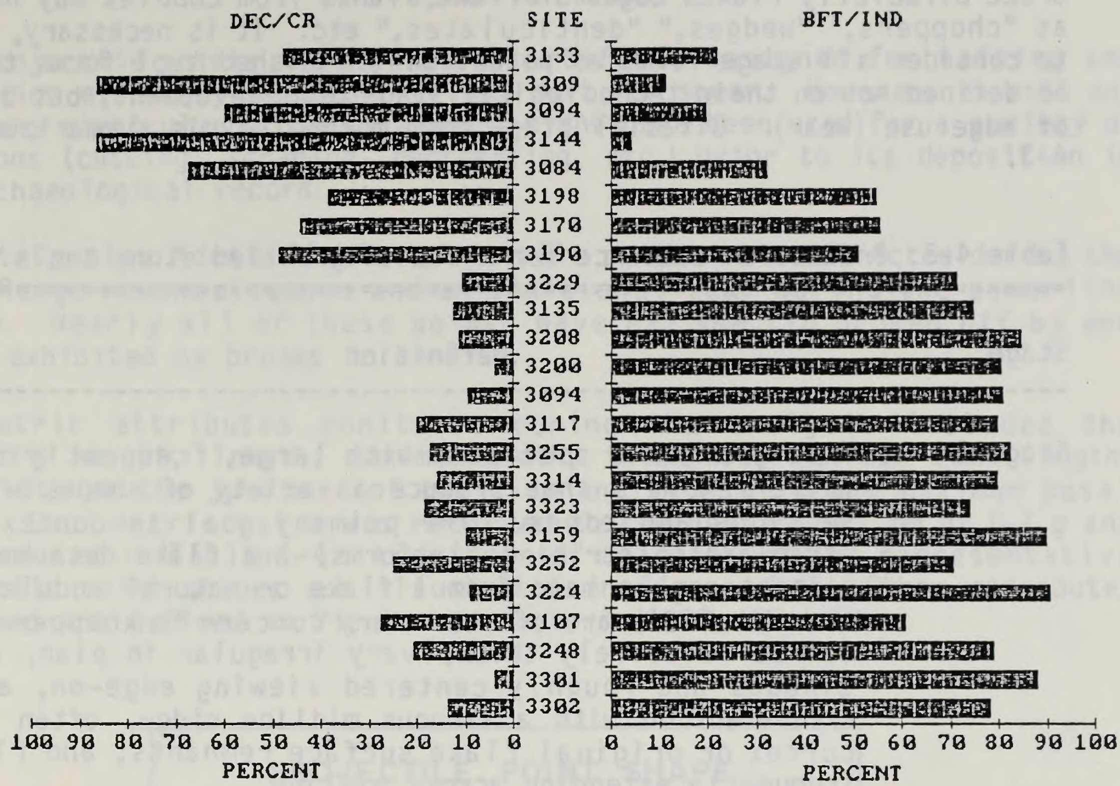

Figure 4-3: Relationship of early (Decortication and Core Reduction) and late (Biface Thinning and Indeterminate) stages of tool production in debitage sample units for divisions of sites in the Groom Range selected for cluster analysis.

Bifacial Stage Form Trajectories

In the manufacture of bifacial tools, an initial piece of toolstone is reduced (flaked) until an acceptable tool is produced or the reduced specimen is discarded because of breakage or because the toolstone becomes unsuited for forming the desired artifact. This manufacturing process is a continuum of a series of reduction stages represented by each flake removal. Because the production sequence may terminate at any time after the first flake is removed, it is technologically meaningful to categorize bifacially thinned artifacts according to an idealized model of stage forms directed toward a desired end product. In this model we conceptualize a sequence proceeding from platform establishment through edge regularization, thinning, shaping and haft preparation. Of course, there will be instances of reduction sequences where the artisan does not follow each of the above procedures because the stage form may be manufactured from a thin flake blank by merely sharpening a flake's edge and notching the base, thereby bypassing earlier stages directed toward reducing the thickness of the stage form. Conversely, not all reduction sequences had thin, bifacially flaked, and notched tools as the desired end product.

Crude bifacially flaked edges of flake blanks from cobbles may have served as "choppers," "wedges," "denticulates," etc. It is necessary, therefore, to consider all stage forms as potentially finished tool forms that should be defined not on their technological stage of development, but by evidence of edge use (wear). Bifacial stage form morphology is summarized in Table 4-3.

Table 4-3: Production sequence for bifacially flaked stone tools.

Stage	Definition
Stage I	Thick, angular specimens with large, frequently irregular, flake removals that produce a variety of shapes with uneven sections and edges. The primary goal is cortex removal, establishing striking platforms, and flake detachment. These bifaces can be made from a flake or natural nodule. Outline and thickness are of secondary concern to knapper. The form can be relatively thick, very irregular in plan, edges very sinuous and roughly centered viewing edge-on, angular in cross-section with a sinuous midline ridge, often exhibiting cortex or original flake surface remnants, and flake scars frequently extending across midline.
Stage II	The primary goals is to roughly thin and regularize edges through percussion flaking. Platforms are maintained through strengthening and repositioning. The biface is thick with cross-section less angular and more rounded; midline ridge is prominent, moderately regular and centered though sinuous; tip and base are distinguishable.
Stage III	Primary goal is thinning of the biface's cross-section. Flakes are often removed in series, extending across midline. Flake scars are broad and expanding commonly removed with soft billets. Pressure edge retouch may be located irregularly along edge in preparation for flake removals. The object form is thin (approximately the thickness of the final desired tool), tip and base are well delineated though not notched, edges are nearly straight viewed edge-on and often centered. Lanceolate forms may exhibit parallel, oblique flake removals at this stage.
Stage IV	Primary goal is the production of regular edge outlines which are straight when viewed edge-on. Thick arris remnants along edge are removed through pressure flaking. The tool form is complete except for hafting element formation. This often constitutes a "preform" stage.
Stage V	Primary goal is the production of shoulder and haft elements. Even in outline and regular in cross-section.

Projectile Points

Projectile points are defined as artifacts designed for hafting and propulsion either by an arrow, atlatl dart, or spear. However, as with any tool, any particular projectile point might have been used for a variety of functions (cutting, scraping, perforating, etc.) prior to its deposition in the archaeological record.

Sixty-nine identifiable projectile points were collected during the Groom Range reconnaissance and an additional four during the powerline survey. Nearly all of these points have had the tip broken off by end shock, exhibited by breaks in bending.

Metric attributes monitored during the analysis included the artifact's weight, length, maximum width, thickness, maximum stem length, stem width at the juncture of the stem and shoulder, and maximum basal width. Each metric value was recorded to the nearest 0.1 mm or 0.1 g and is presented in Table 4-4. Locations of measurements on representative projectile point shapes are illustrated in Figure 4-4. Other attributes mentioned are defined in Pippin and Hattori (1980, fig. 10).

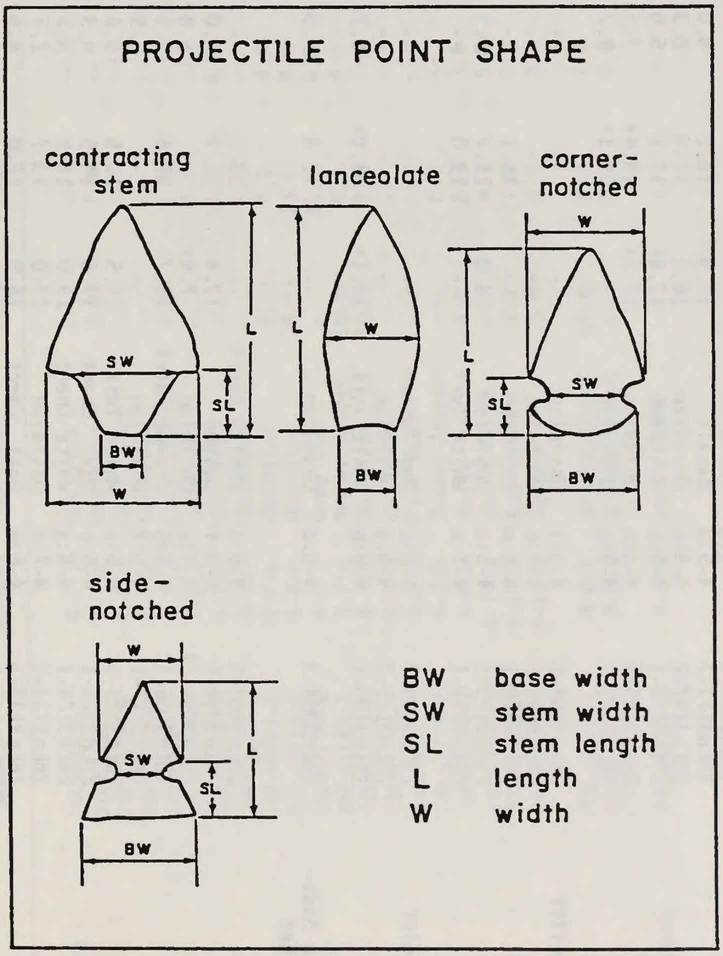

Figure 4-4: Location of metric attributes of projectile points summarized on Table 4-4.

Table 4-4: Metric attributes of projectile points collected from archaeological sites in the Groom Range.

Series	Specimen Number	Illus. Number	Toolstone	Base Width (mm)	Stem Width (mm)	Stem Length (mm)	Length (mm)	Width (mm)	Thickness (mm)	Weight (g)
Pinto	26Ln3087-1	4-5:j	Obsidian	--	--	6.7	28.0+	14.5+	4.7	2.3+
	26Ln3094-10	4-5:f	Obsidian	14.1	14.3	3.7	21.1	15.5	6.8	2.4
	26Ln3123-2	4-5:a	Basalt	15.2	12.9	8.3	30.3+	19.9	7.7	4.5+
	26Ln3123-3	4-5:g	Obsidian	--	--	--	18.4+	18.8	6.4	2.2+
	26Ln3127-2	4-5:d	Basalt	17.9	16.2	9.0	28.4+	18.4	4.2	2.5
	26Ln3137-2	4-5:c	Obsidian	16.1	12.9	8.3	32.2+	21.0	7.9	5.0
	27Ln3278-1	4-5:b	Obsidian	12.8+	12.0	5.0	30.4+	14.3	17.9	4.3
	26Ln3295-1	4-5:h	Obsidian	19.7+	14.4+	7.5+	19.9+	19.6+	6.8	2.9+
	26Ln3325-2	4-5:e	Obsidian	--	14.1+	8.2	32.2	16.9+	7.0	4.1
Gatecliff	26Ln3094-6	4-5:l	Obsidian	--	--	--	21.8+	23.7	5.0	2.4
	26Ln3094-9	4-5:k	Obsidian	--	--	--	25.8+	14.7+	4.9	1.6
	26Ln3118-1	4-5:m	Obsidian	--	16.1	--	41.7+	21.5	6.8	6.0+
	26Ln3125-1	4-5:o	Obsidian	8.0	11.7	6.5	26.4	19.7	3.9	2.2
	26Ln3248-1	4-5:n	White Tuff	--	13.0	--	43.0+	25.0	6.4	4.7
Humboldt	26Ln3094-7	4-6:c	Red Jasper	--	--	--	35.0+	18.1	6.7	4.6
	26Ln3125-2	4-6:a	Obsidian	--	--	--	20.8+	16.0	4.3	1.3+
	26Ln3133-1	4-6:b	White Tuff	21.1+	21.0+	5.2+	25.9	24.1	4.8	3.6
Large Side-Notched	26Ln3094-3	4-6:d	Obsidian	--	12.8	10.9	26.4+	21.2+	5.2	2.6+
Elko	26Ln3084-4	4-6:l	Yellow Chert	--	13.2	--	20.8+	25.7	4.1	2.3+
	26Ln3094-5	4-6:f	Jasper	17.4	11.7	13.0	34.3+	25.6	6.3	5.9+
	26Ln3094-11	4-7:e	Obsidian	7.9+	--	5.9+	26.3+	20.4	5.8	2.9+
	26Ln3106-1	4-6:g	Orange Chert	19.7	11.6	12.5	21.9+	24.0+	6.6	3.3+
	26Ln3117-1	4-5:i	Obsidian	--	--	5.9	15.4+	14.4+	4.2	1.5+
	26Ln3123-1	4-6:e	White Tuff	15.5	10.5	10.6	35.1+	25.3	5.4	5.7+
	26Ln3124-1	4-6:k	Opal. Chert	17.5	14.5	6.3	22.0+	20.9	4.3	2.4
	26Ln3129-1	4-6:j	White Chert	19.0	15.8	9.5	37.8+	22.9+	8.9	8.1+
	26Ln3133-2	4-7:d	Obsidian	12.0	13.7	2.7	17.3+	25.1+	4.2	1.5+
	26Ln3133-3	4-6:n	Opal. Chert	16.8	12.0	6.8	15.6+	18.9	4.0	1.4
	26Ln3133-4	4-7:a	Red Jasper	--	--	--	20.4+	23.8	4.3	1.9
	26Ln3135-1	4-7:c	Tuff	--	--	--	21.2+	21.8	4.5	2.3+
	26Ln3161-1	4-7:b	Orange Chert	--	--	--	33.0+	22.0	5.0	4.5+
	26Ln3256-1	4-6:i	Red Jasper	--	11.8	7.2	22.7+	23.6+	4.4	2.6+
	26Ln3285-2	4-6:h	Obsidian	--	--	--	36.2	26.6	8.2	6.6
	26Ln3299-1	4-6:m	Opal. Chert	--	--	--	29.0+	20.0+	4.8	2.8+
	26Ln3331-3*	4-14:b	Quartzite	14.4+	13.0	9.5+	48.1+	28.6	8.0	12.7+

+ Incomplete measurement due to artifact breakage
* Artifact found during powerline survey

Table 4-4: Metric attributes of projectile points collected from archaeological sites in the Groom Range (cont'd).

Series	Specimen Number	Illus. Number	Toolstone	Base Width (mm)	Stem Width (mm)	Stem Length (mm)	Length (mm)	Width (mm)	Thickness (mm)	Weight (g)
Rosegate	26Ln3086-1	4-7:j	Obsidian	--	--	--	18.0+	20.0+	3.2	1.2+
	26Ln3094-2	4-7:h	Obsidian	8.9+	7.9	--	30.8+	16.5	3.6	1.5+
	26Ln3094-4	4-7:m	Opal. Chert	--	--	--	25.5+	15.0	3.0	1.2+
	26Ln3094-8	4-7:n	Obsidian	--	--	--	21.4+	13.1	4.0	1.1+
	26Ln3097-1	4-7:l	Grey Chert	7.4+	8.3	--	23.3+	15.0	4.0	1.1+
	26Ln3097-6	4-8:e	Obsidian	--	8.1+	--	20.1+	15.6	2.6	1.0+
	26Ln3106-2	4-7:k	Obsidian	--	10.6	4.3	18.1+	17.2	4.8	1.5
	26Ln3110-1	4-7:i	Obsidian	--	8.5	--	29.5+	21.6	5.1	2.4+
	26Ln3124-4	4-7:o	Obsidian	8.2+	7.1	4.4+	17.3+	13.4	3.6	0.7+
	26Ln3133-5	4-8:c	Obsidian	14.9+	13.0	8.0	15.4+	14.5+	4.1	1.0
	26Ln3134-1	4-8:f	Grey Chert	--	11.5	4.4	29.1+	20.5	4.1	2.3+
	26Ln3143-1	4-7:g	Brown Jasper	10.9	8.1	4.0	33.0	17.2	4.0	1.5
	26Ln3156-1	4-7:f	Obsidian	10.0+	9.5	--	22.2	18.1	2.9	1.3
	26Ln3159-1	4-8:a	Obsidian	--	--	--	17.3+	15.8+	3.6	0.7+
	26Ln3302-1	4-8:g	Pink Tuff	--	--	--	19.1+	14.8+	3.9	1.0+
	26Ln3310-2	4-8:b	Brown Jasper	--	8.0	--	23.5	15.1	2.8	0.9+
	36Ln3314-1	4-8:h	White Tuff	8.0	6.7	3.6	14.2+	17.2	3.6	0.9+
	26Ln3331-1*	4-14:a	White Chert	--	9.7	5.6+	22.3+	17.5+	4.4	1.8+
	26Ln3331-2*	4-14:d	Red Chert	4.1	7.5	5.0	23.9+	18.6	5.0	2.1+
	26Ln3337-1*	4-14:c	Jasper	8.5+	8.5	3.5	18.6+	22.0	2.7	1.4+
Desert	26Ln3308-1	4-8:i	Orange Chert	14.0	9.2	7.1	22.5+	11.5	3.2	1.1+
	26Ln3329-1	4-8:j	Orange Chert	--	8.1	4.4	17.0+	10.7	2.9	0.6+
Cottonwood	26Ln3107-1	4-8:k	White Tuff	--	--	--	14.4	10.6	2.5	0.3

+ Incomplete measurement due to artifact breakage
* Artifact found during powerline survey

Clovis

Two Clovis projectile points have been found near Groom Lake by private collectors. These points are illustrated in Davis and Shutler (1969, fig. 2d and fig. 3e). One point (fig. 2d) is obsidian, 3.4 cm wide and 1.0 cm thick. The other (fig. 3e) is a volcanic, 3.9 cm wide and 1.0 cm thick. Both specimens are bases exhibiting several fluting scars on both sides, with base and sides ground, basal thinning, and pressure flaking. Percussion flaking was not identified on the specimens (Davis and Shutler 1969, Table 1).

Great Basin Stemmed Series

The only projectile point of this type found in the Groom Range was just off the boundaries of the study area and was not collected. The Sheahans possess a base from another Great Basin Stemmed projectile point they collected from somewhere in the Groom Range (Pat Sheahan, personal communication). These points are morphologically similar to the Lake Mohave style of dart or spear point first described by Amsden (1937:80-81, 83, Plate 41) from the ancient shores of Pleistocene Lake Mohave (Campbell et al. 1937). These specimens are marked by gradually contracting and heavily ground or crushed stems and convex bases.

Pinto Series

Nine projectile points from the Groom Range project area are similar to the Pinto style points reported by Amsden (1935:44) from the Pinto Basin Site (Campbell and Campbell 1935). The Pinto points from the Groom Range are characterized by crude workmanship, side or corner notches, concave bases, and a relatively thick cross section (Figure 4-5:a-h,j).

Gatecliff Series

Five projectile points that conform to the Gatecliff Contracting Stem type (Thomas 1983:183, 184, fig. 81). These large projectile points, which have also been called Gypsum and Elko contracting stem points, are typified by a sharply contracting stem and a straight to slightly convex base (Figure 4-5:k-o).

Humboldt Series

Three projectile points from the Groom Range have been classified as belonging to the Humboldt Series (Heizer and Clewlow 1968:68). These points are lanceolate in overall shape and are typified by a lack of definable shoulders and concave bases.

Specimen 26Ln3094-7 is a typical large Humboldt made of red chert. The anterior portion of this artifact has been reworked into a drill. The point of the drill has broken off at the juncture with the base (Figure 4-6:c).

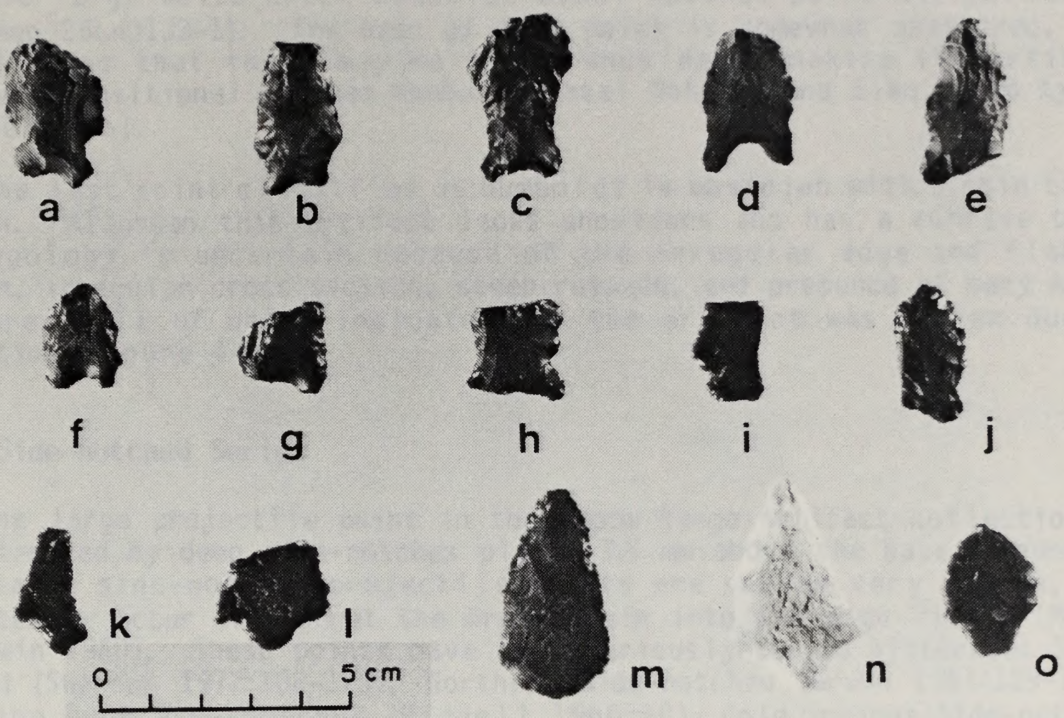

Figure 4-5: Pinto (a-h,j), Elko (i), and Gatecliff (k-o) Series projectile points from the Groom Range, Lincoln County, Nevada.

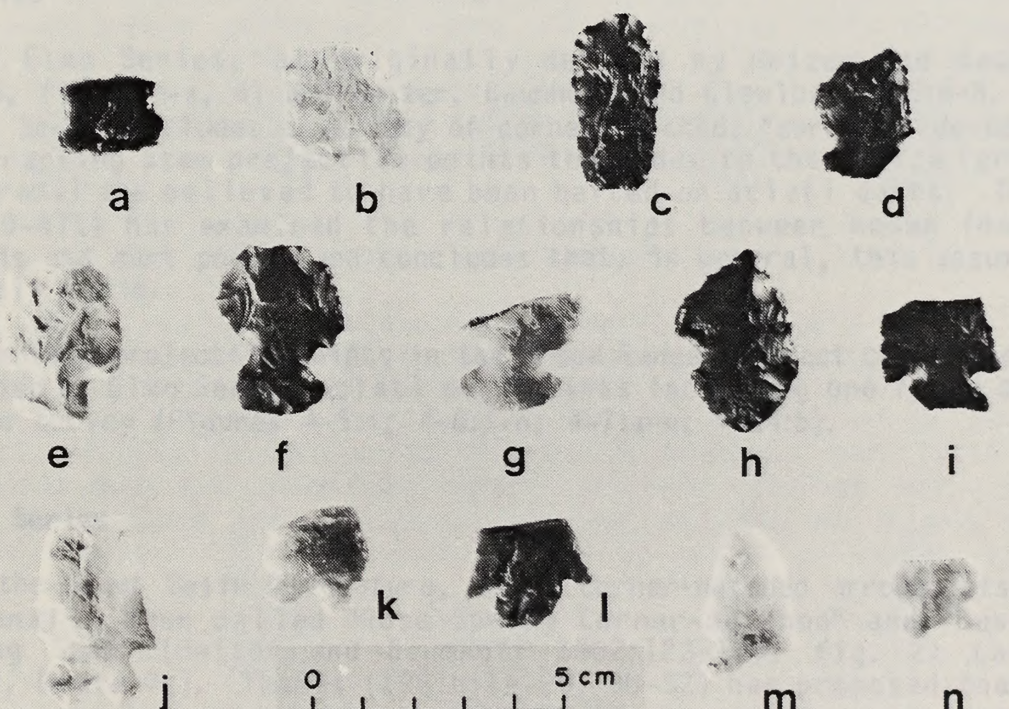

Figure 4-6: Humboldt (a-c), Large Side-Notched (d) and Elko (e-n) Series projectile points from the Groom Range, Lincoln County, Nevada.

One large white chert Humboldt Basal Notched point was collected (specimen 26Ln3133-1). The base of this point is somewhat shattered, but it indicates that there may be small shoulders, making the artifact somewhat transitional between Humboldt Basal Notched and Elko Eared types. (Figure 4-6:b).

The last point classified as Humboldt is obsidian with a thin cross section. Although this artifact lacks shoulders and has a concave base, the typology is uncertain because of the irregular edge and flaking pattern, irregular cross section, steep retouch, and presence of many hinge fractures, all of which indicate that the artifact was broken during production (Figure 4-6:a).

Large Side-notched Series

One large projectile point in the Groom Range artifact collection is characterized by deep side-notches placed 7.5 mm above the base (Figure 4-6:d). Large side-notched projectile points are seldom very common, but consistently occur throughout the Great Basin into the High Plains (Mason and Irwin 1960). These points have been variously termed Bitterroot Side-notched (Swanson 1972:108-113), Northern Side-notched (Gruhn 1961:129-130), Madeline Dune Side-notched (Riddell 1960:18), Cold Springs Side-notched (Butler 1978:6-8), Elko Side-notched (Heizer, Baumhoff and Clewlow 1968:6, fig. 1 a-h) and Martis Side notched (Elston et al. 1977:64).

Elko Series

The Elko Series, as originally defined by Heizer and Baumhoff (1962:128, figs. 3n-x, 4) and Heizer, Baumhoff and Clewlow (1968:6-8, figs. 1l-q, 2, 3a-k), includes a variety of corner-notched, "eared," side-notched and contracting stem projectile points that, due to their size (greater than 3 grams) are believed to have been hafted on atlatl darts. Thomas (1978:469-471) has examined the relationships between known (hafted) arrowheads and dart points and concludes that, in general, this assumption is probably valid.

Seventeen projectile points in the Groom Range artifact collection are classified as Elko Series atlatl dart points including one found on the powerline survey (Figures 4-5:i; 4-6:j-n; 4-7:a-e; 4-14:b).

Rosegate Series

In the Great Basin literature, small corner-notched arrowpoints have traditionally been called "Rose Spring Corner-notched" and "Eastgate Expanding Stem" (Heizer and Baumhoff 1962:123-124, fig. 2; Lanning 1963:352, Plate 7c). Thomas (1981b:19-20, 30-32) has proposed that the term "Rosegate Series" be used for all small corner-notched points with basal widths less than or equal to 10 mm and with expanding stems. He suggests that both Rose Spring Corner-notched and Eastgate Expanding Stem styles of corner-notched arrowpoints merge together in morphological features and represent a single temporal indicator.

Seventeen arrowheads from the main Groom Range survey (Figures 4-7:f-o; 4-8:a-h) belong to the Rosegate Series as designed by Thomas (1981b). Three additional Rosegate Series points were collected during the powerline survey.

Desert Side-notched Series

Two small projectile points from the Groom Range (Figure 4-8:i-j) conform to the Desert Side-notched style as defined by Baumhoff (1957:10) and outlined by Baumhoff and Byrne (1959).

Cottonwood Series

One small triangular point was found which would fit in the Cottonwood Series (Heizer and Hester 1978:11). The base and edges of this white chert point are slightly concave and the shoulders are truncated (Figure 4-8:k).

Drills

Fragments of five flaked stone drills were collected during the project. Three of these specimens (Figure 4-8:l-n) exhibit rectangular bases. One drill tip has a very regular outline caused by steep small flakes, crushing, and heavy polish of the edges (Figure 4-8:o). Another drill was made by reworking a Humboldt concave base projectile point base (Figure 4-6:c). Finally, it is revealing to note that, although a high proportion (45.8 percent) of the projectile points in the Groom Range were made obsidian, drills were consistently made from other toolstone. This may reflect the fact that, while obsidian is easily knapped, it is also quite brittle and other toolstones may have been more resistant to the types of stresses placed on stone drills.

Pendants and Pendant Blanks

Six artifacts were found in the project area, all formed by grinding and polishing, which have been classified as pendants or portions of pendants. Two pendants, formed from thin (3.4 mm thick) slabs of identical greenish-gray slate, were found near one another at site 26Ln3310. Both artifacts are tear drop shaped with biconical perforations at the small ends. Both pendants have been lightly polished, but deep striations from the shaping and thinning are still visible. The pendants are similar in size, measuring 46.1 by 27.6 mm and 45.0 by 35.3 mm (Figure 4-9:f,g).

A calcite crystal from 26Ln3182-1, was shaped into a pendant by simply perforating one end (Figure 4-9:e). The crystal is quite large (44.7 by 17.0 by 7.8 mm) and, the perforation is biconical. The crystal is thinned to 4 mm where the string was attached above the perforation. Aside from these changes, the crystal is unmodified.

A finely grained white cryptocrystalline rock from site 26Ln3094-1, had been laboriously ground into a thin (2.5 mm) section, polished, and the entire edge ground into small V shaped serrations. The surfaces bear many

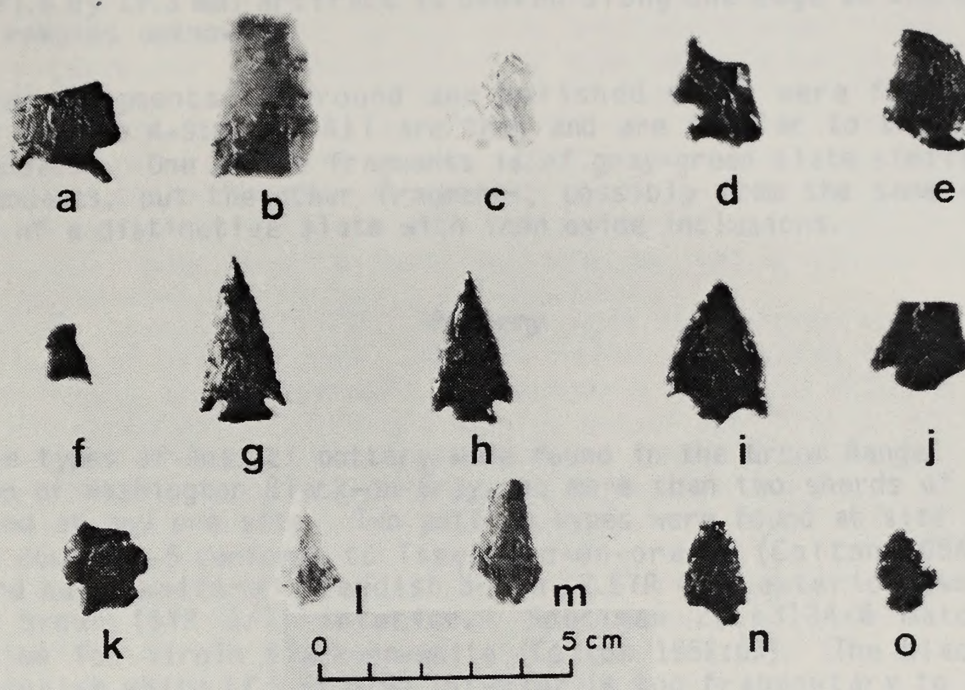

Figure 4-7: Elko (a-e) and Rosegate (g-o) Series projectile points from the Groom Range, Lincoln County, Nevada.

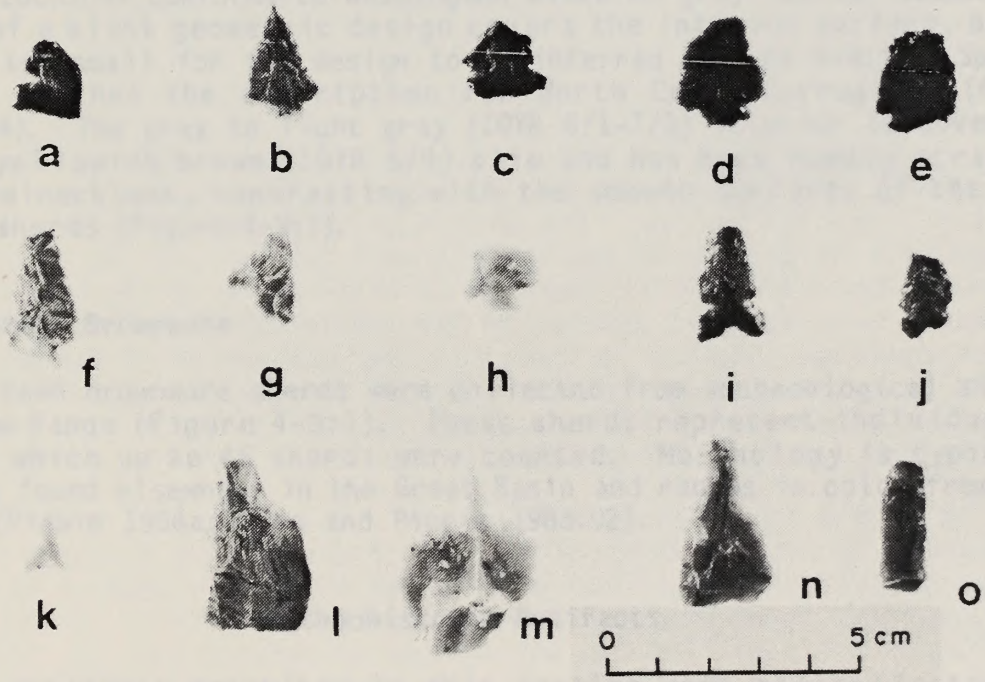

Figure 4-8: Rosegate (a-h), Desert (i-j), and Cottonwood (k) Series projectile points and drills (l-o) from the Groom Range, Lincoln County, Nevada.

deep striations from the rough shaping of the artifact which have only partially been obscured by subsequent heavy polishing (Figure 4-9:h). This small (21.6 by 17.3 mm) artifact is broken along one edge so the complete outline remains unknown.

Three fragments of ground and polished slate were found at site 26Ln3084 (Figure 4-9:a-c). All are thin and are similar to the above two slate pendants. One of the fragments is of gray-green slate similar to the above pendants, but the other fragments, possibly from the same artifact, are made of a distinctive slate with iron oxide inclusions.

Pottery

Anasazi

Five types of Anasazi pottery were found in the Groom Range. With the exception of Washington Black-on-Gray, no more than two sherds of any type were found at any one site. Two pottery types were found at site 26Ln3124. Specimen 26Ln3124-5 conforms to Tsegi Red-on-orange (Colton 1956). This rim sherd has a uniformly reddish brown (2.5YR 4/4) exterior and a light reddish brown (5YR 6/3) interior. Specimen 26Ln3124-6 matches the description for Virgin Black-on-white (Colton 1952:63). The black design on the pinkish white (7.5 YR 8/4) interior is too fragmentary to identify specific design elements.

Two sherds matching the description for Abajo Red-on-orange (Breternitz, Rohn and Morris 1974:49-50) were found at Site 26Ln3117 (Figure 4-9:k). The interior surface is divided into two shades of red, 2.5YR 5/6 and 4/6. Specimen 26Ln3094 conforms to Washington Black-on-gray (Colton 1952:39). A portion of a black geometric design covers the interior surface, but the sherd is too small for the design to be inferred (Figure 4-9:j). Specimen 26Ln3097 matches the description for North Creek Corrugated (Colton 1952:23-24). The gray to light gray (10YR 6/1-7/1) interior is covered by a light yellowish brown (10YR 6/4) slip and has been deeply scraped in several directions, contrasting with the smooth surfaces of the other Anasazi sherds (Figure 4-9:i).

Intermountain Brownware

Thirteen brownware sherds were collected from archaeological sites in the Groom Range (Figure 4-9:l). These sherds represent individual pot drops at which up to 46 sherds were counted. Morphology is typical of brownware found elsewhere in the Great Basin and ranges in color from brown to gray (Pippin 1986a; Reno and Pippin 1985:92).

Ethnohistoric Artifacts

The artifacts described in this section were all collected from aboriginal sites, but unquestionably date to post-Euroamerican contact times. Consequently, they probably represent Euroamerican items adopted by historic Numic speakers. The first artifact was a cow horn found cached in a cleft in a rockshelter at site 26Ln3097 (Figure 4-10:b). Although this horn is not modified, it is not possible that the horn could have reached its position in any natural way. The second artifact was the most enigmatic artifact found during the project. It was a 41 x 10 x 2.2 cm piece of milled wood that had been carved into a rough ellipsoid, a 12 cm biconical hole had been bored through one end, and the area around the hole thinned to 17 mm (Figure 4-10:a). Five clenched square nails holes existed in the board prior to it being carved into its present shape. This artifact was cached in a crack in the wall of a rockshelter at site 26Ln3088. A similar artifact, tentatively identified as a bullroarer, was found at Hogup Cave (Aikens 1970:173; fig. 123). The Hogup specimen (19.0 x 3.6 x 1.2 cm) is smaller than the Groom artifact and lacks a knob.

A Starr carbine was found near 26Ln3097, The Condos. This carbine was patented by Ebenezer T. Starr in 1858. These rifles have a fixed barrel and a movable two-piece breechblock. "The breechblock proper, hinged under the barrel breech, was backed by a vertically sliding wedge controlled by a trigger-guard/underlever. Pushing the lever downward and forward pulled down the wedge and allowed the breechblock to pivot backward and downward, exposing the chamber for loading" (Garavaglia and Worman 1984:196). Between 1863 and 1864 over 20,000 of the .54 caliber carbines were delivered to the government. These weapons were designed for a paper or linen cartridge. An additional 5000 purchased by the government in 1865 were chambered for the .54 caliber Spencer metallic cartridge (Garavaglia and Worman 1984:197; Lustyik 1966). The barrel of the Groom specimen has been bent (Figure 4-11:a) as by being used as a lever.

Specimen 26Ln3097-1 (Figure 4-10:d) is a small (10 x 9.5 x 3.5 cm) iron bottle made of unusually thick metal. This bottle has a 12 mm internal diameter neck with internal threads. The stopper was missing, but was found on the floor of a rockshelter at the Condos.

Historic Artifacts

Several historic artifacts were collected from Cattle Spring (Site 26Ln3295). An improvised candle lantern (Figure 4-12) was made out of a 23.5 x 13.5 x 8.2 cm can. The original bail serves as the handle. The lower half of one end of the can has been cut out and the hole filled with a broken bottle which has been wired in place to serve as a lens. A 2 cm diameter hole has been punched in the bottom of the can to admit a candle, which could be inserted farther into the lantern as it burned. Three air holes have been punched in both sides of the can near the base. The bottle is clear glass with bubbles and was formed in a post bottom mold. Such improvised lanterns are present on many historic mining sites (Reno 1983).

A 12.5 x 10 cm diameter can was collected at Cattle Spring that presents an interesting collection of morphologic features illustrating transitional technology from hole-in-cap to modern double seamed design. Side and end seams are all double seamed but there is a vent hole on the bottom of the can. The can was opened by cutting out the end of the can with a can opener or knife. This end was resealed with a press-on lid, prior to the advent of plastic lids. The opened end has embossed instructions for opening and the lid bears an advertisement for Tree Tea.

A small (52 x 27 x 14 mm) brass flask plated with chrome or a similar substance was found. The closure bears external threads and the oval base is stamped PAT'D APRIL 23.95 MADE IN U.S.A. PAT'D APRIL 6.97 (Figure 4-13:d). Specimen 26Ln3286-1 is a miner's pick and hammer with a heavily weathered handle (Figure 4-11:b). This type of pick was popular in the latter portion of the nineteenth century. Two fragments of glass were collected from the Cattle Spring. One of these fragments is the closure from a small purple bottle which has been formed by a lipping tool (Figure 4-13:c). The other fragment is a clear lip decorated with small conical projections similar to the drip points on telephone wire insulators (Figure 4-13:a). Finally, A small crucible of the type and for assaying ore was also collected from Cattle Spring (Figure 4-13:b).

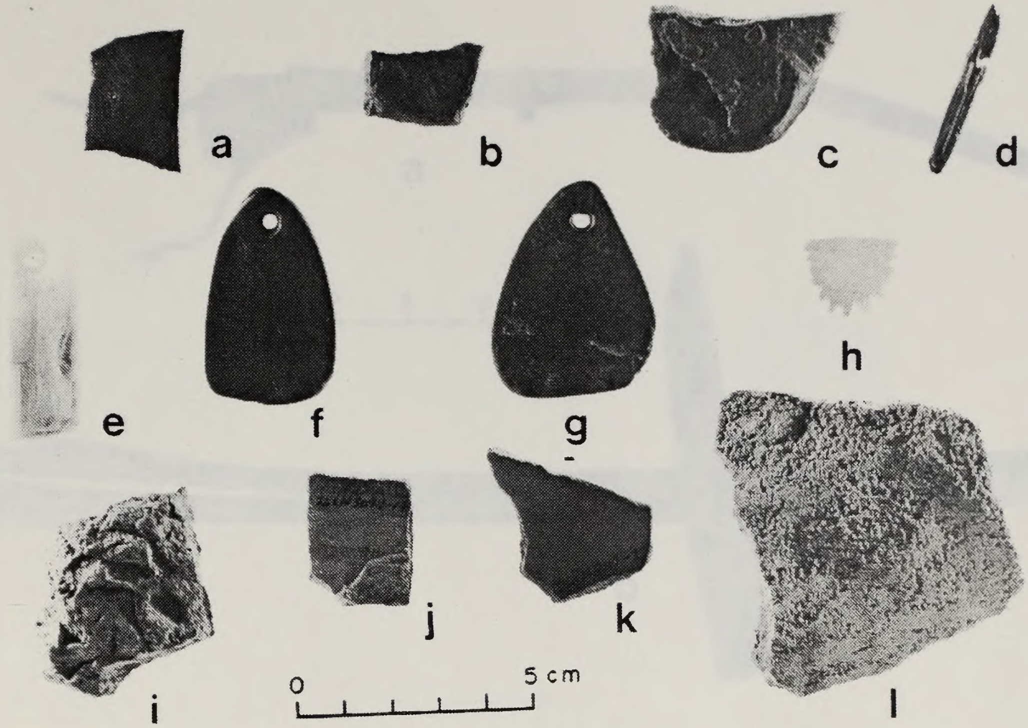

Figure 4-9: Shaped stone, drilled stick (d), pendants (e-g), Anasazi pottery (i-k), and intermountain brownware (l).

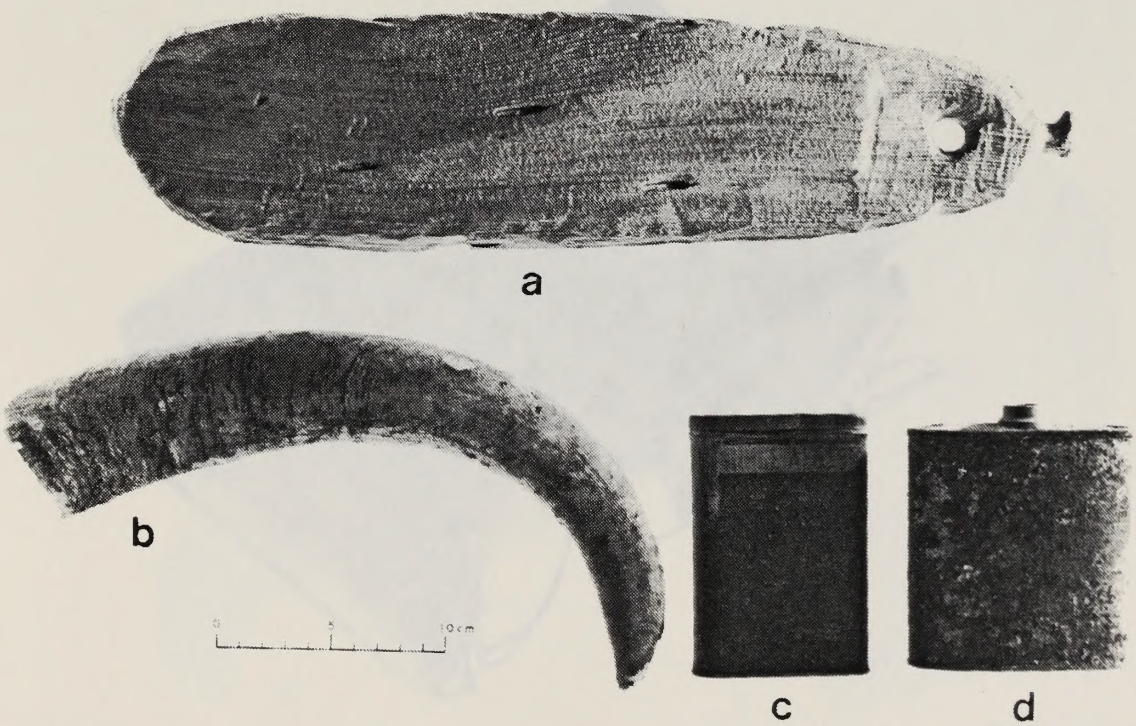

Figure 4-10: Carved board (a), cow horn (b), and cans (c-d) from the Groom Range, Lincoln County, Nevada.

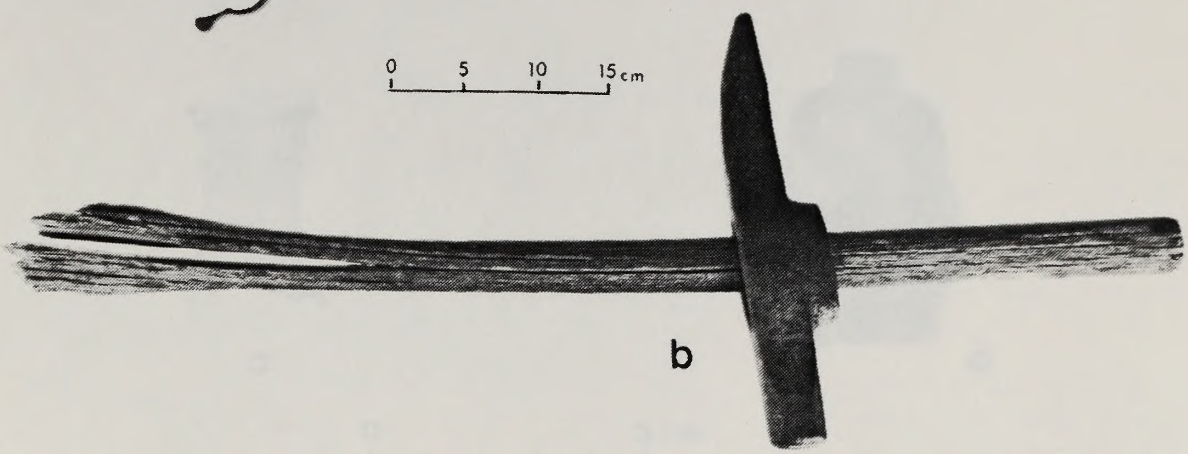

Figure 4-11: Starr Carbine (a) and miners pick (b) from the Groom Range, Lincoln County, Nevada.

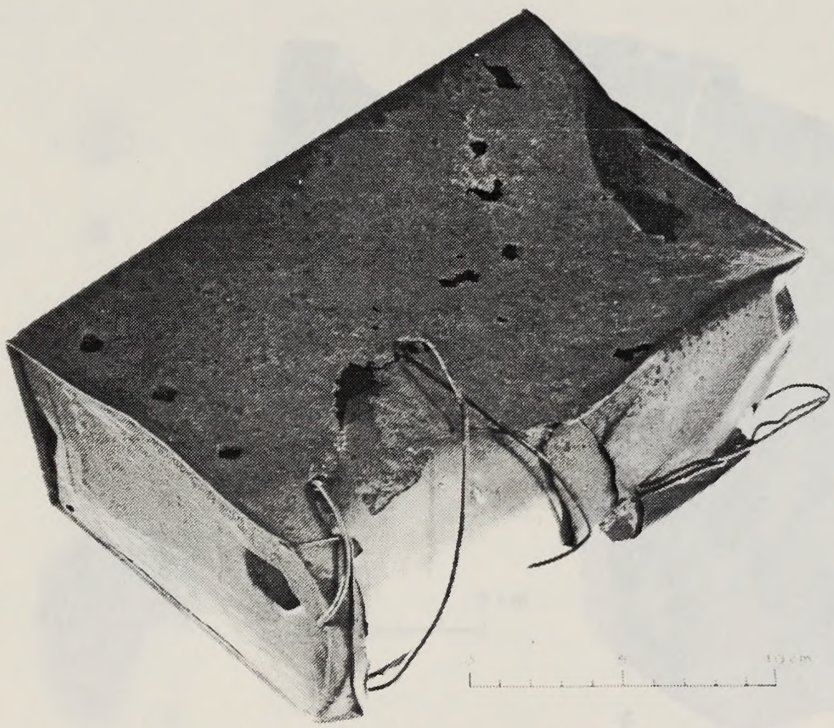

Figure 4-12: Candle lantern from the Groom Range, Lincoln County, Nevada. Lens is at lower right above scale. Candle was inserted in large hole in bottom of can, visible at lower left side of photograph.

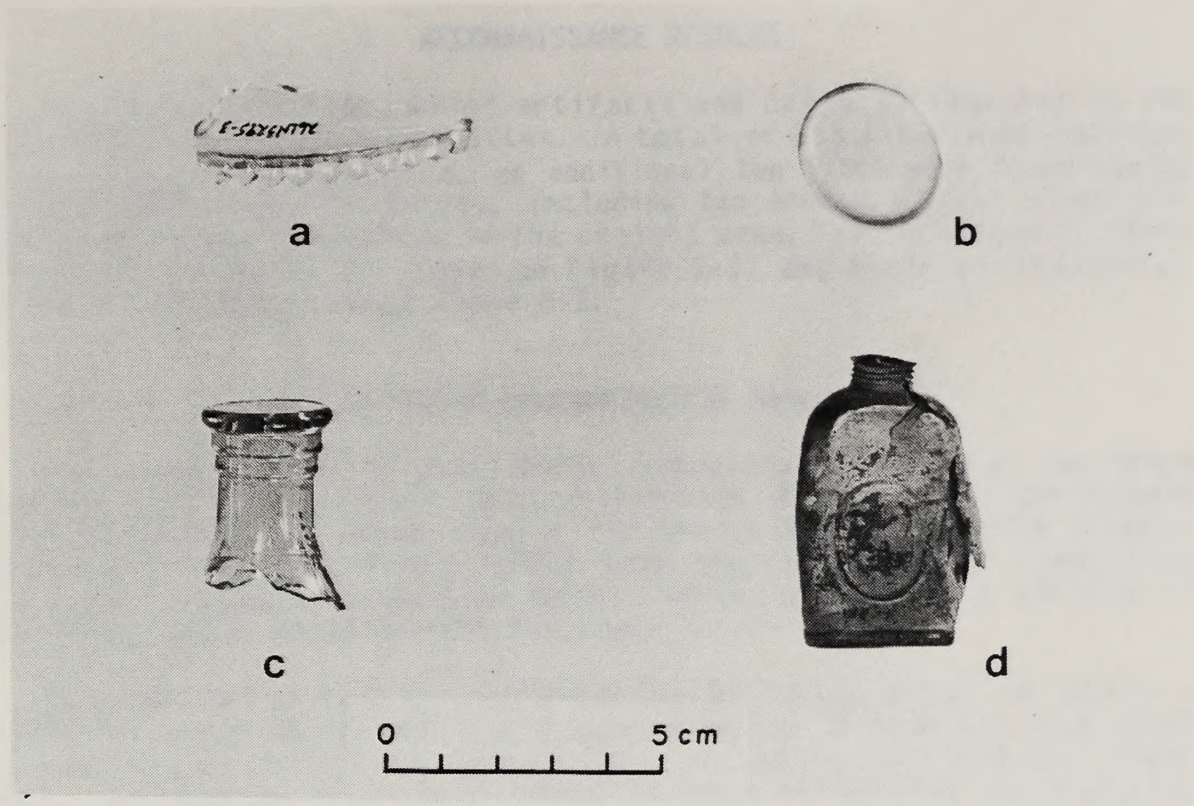

Figure 4-13: Historic artifacts from the Groom Range, Lincoln County, Nevada. (a) clear glass fragment, (b) crucible lid, (c) purple bottle fragment, (d) brass flask.

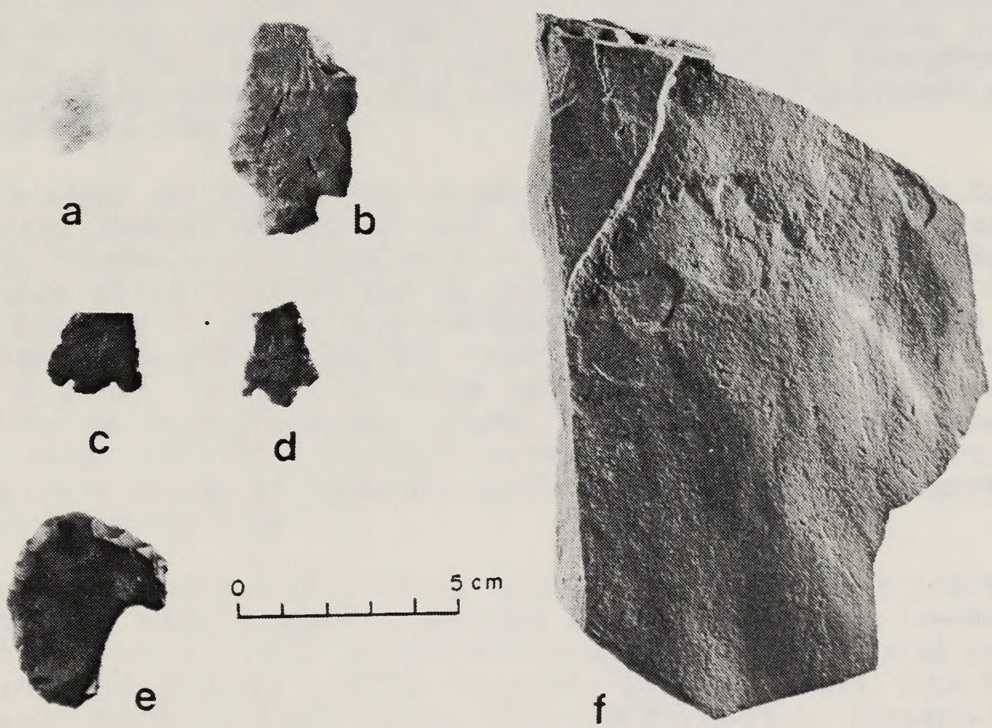

Figure 4-14: Rose Spring (a,c-d), and Elko (b) Series projectile points, uniface (e) and incised stone (f) collected on the powerline survey, Groom Range, Lincoln County, Nevada.

5. RECONNAISSANCE RESULTS

Distinct concentrations of artifacts and cultural features in the Groom Range were recorded as sites. A total of 255 sites were recorded during the main reconnaissance, an additional ten sites were found during the subsequent powerline survey, including two archaeological sites that had been previously recorded in the project area. The locations of these archaeological sites are shown on Figure 5-1, and their environmental attributes are summarized in Table 5-1.

Prehistoric Archaeological Sites

The classification of prehistoric archaeological sites in the Groom Range has been based on their inferred function and in general corresponds to the classification system used on the nearby Nevada Test Site (Pippin, Clerico and Reno 1982; Pippin 1984a; Reno and Pippin 1985). Identified site types include residential bases, temporary camps, a variety of localities, and sites of unknown function.

Residential bases are inferred to be those sites at which a residential group maintained itself over a period of time and from which all subsistence activities originated. According to Binford's (1980) model, residential bases are common to both collecting and foraging subsistence strategies. However, residential bases occupied by collectors should exhibit evidence of decreased residential mobility such as storage facilities; coarse grained, heterogeneous artifact assemblages; diverse botanical and zoological remains; settlement locations optimally situated between several potential resource zones; etc. Residential bases produced by a foraging strategy, conversely should lack the above evidence of long term occupation. Rather, they should exhibit a fine grained, homogeneous artifact assemblage with each site, but increased interassemblage variability (Binford 1980:17-19).

Temporary camps are those sites at which logistically organized task groups maintain themselves while away from their residential base. Consequently, theoretically they portray a collecting strategy. But, temporary camps of collectors may be difficult to distinguish from residential bases of foragers. Because temporary camps are occupied by task groups seeking specific resources, their nature should vary with the resources being sought and the size of the task group used to exploit these resources. Like the above residential bases, these temporary camps should be located in relatively close proximity to food, fuel and water resources, but these resources may be of temporary duration or, in fact, transported for use at the temporary camp.

Localities are those places where hunters and gatherers extracted specific resources. Under a foraging strategy oriented toward the low-bulk extraction of resources, localities are likely to be widely scattered over a resource zone and provide a relatively low artifact input into the archaeological record (Binford 1980:9; Hayden 1978:190-191). Conversely, under collecting strategies generally focused on the high-bulk extraction of resources, these localities might be expected to be more concentrated and yield higher artifact densities. However, the nature of specific localities might be influenced most by the nature and distribution of the

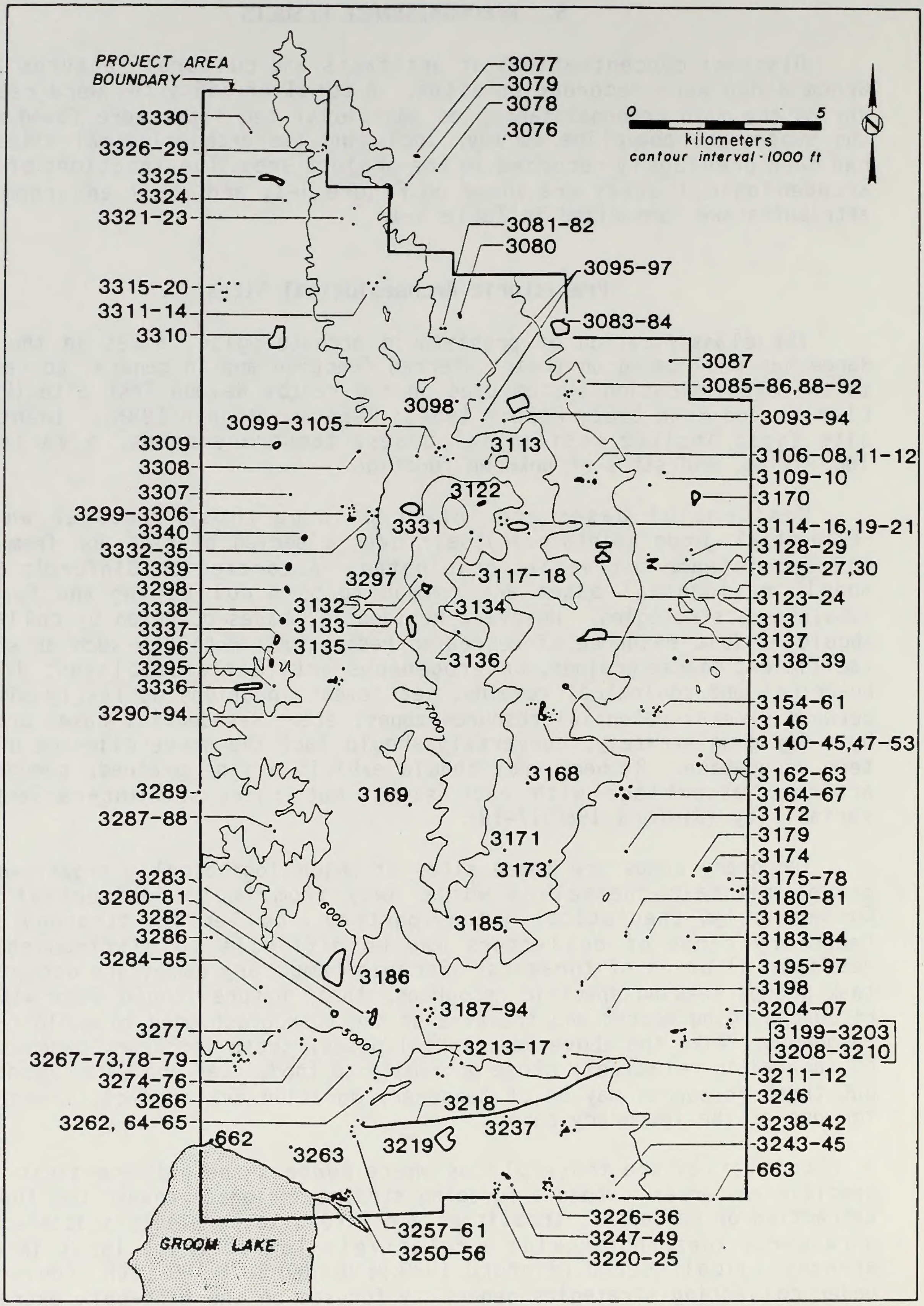

Figure 5-1: Archaeological sites in the Groom Range, Lincoln County, Nevada.

Table 5-1: Selected cultural and environmental attributes of Cultural Resources in the Groom Range, Lincoln County, Nevada.

Site Number	Quadrat	CRES Rating	Site Type	Elevation	Area (Ares)	Dominant Vegetation	Substrate	Potential Depth	Primary Landform	Slope Degrees	Aspect	Diagnostics	Features
26Ln0662	NA	S3	Lithic Scatter	4480	1.57	Saltbush, Creosote, Burro Bush	Alluvium	--	Bolson-Bottom	-	South	None	
26Ln0663	NA	S3	Lithic Scatter	5600	0.78	Blackbrush	--	--	Slope-Interior	-	Southeast	None	
26Ln3076	NA	S2	Temporary Camp	6280	0.00	Juniper-Pinyon	Alluvium/Colluvium	0-20 cm.	Ridge	0	Northeast	Historic/Rosegate/Elko	
26Ln3077	NA	S2	Lithic Scatter Ranching	6600	39.26	Juniper-Pinyon	Alluvium/Bedrock	0-20 cm.	Spring/Seep-Edge	0	Southeast	Historic	Foundation
26Ln3078	NA	S2	Temporary Camp Lithic Scatter	6150	0.00	Juniper-Pinyon	Colluvium	Surface	Fan-Interior	0	North	Brownware	Cairn
26Ln3079	NA	S3	Locality	5800	1.57	Pinyon-Juniper, Big Sagebrush	Alluvium	Surface	Spit/Bar-Top	1	East	None	5 Caches
26Ln3080	8	S3	Temporary Camp Lithic Scatter	6550	100.53	Juniper-Pinyon	Colluvium	Surface	Bench-Top	0	East	Brownware	
26Ln3081	NA	S3	Cache	6900	0.19	Pinyon-Juniper, Big Sagebrush	Alluvium	0-20 cm.	Valley-Bottom	4	Northeast	None	Cache
26Ln3082	NA	S3	Mining Other Historic	6850	15.31	Juniper-Pinyon	Bedrock/Residium	Surface	Slope-Interior	26	Southeast	Historic	Prospect
26Ln3083	9	S3	Isolate	5800	0.00	Juniper-Pinyon, Sagebrush	Alluvium	Surface	Dune-Interior	3	East	None	
26Ln3084	9	S2	Temporary Camp Lithic Scatter	5800	1178.09	Juniper-Pinyon, Sagebrush	Alluvium/Alluvium	0-20 cm.	Fan-Interior	3	East	2 Brownware/1 Elko	
26Ln3085	14	S3	Isolate	6000	0.00	Juniper-Pinyon, Yucca, Big Sagebrush	Bedrock/Residium	Surface	Slope-Face	15	South	None	
26Ln3086	14	S3	Lithic Scatter	6000	0.00	Juniper-Pinyon, Yucca, Big Sagebrush	Bedrock/Residium	Surface	Slope-Interior	0	North	None	
26Ln3087	12	S4	Isolate	5300	0.00	Juniper, Big Sagebrush	Alluvium	Surface	Fan-Face	2	Southeast	Pinto	
26Ln3088	14	S3	Temporary Camp	6000	2.35	Juniper-Pinyon, Yucca, Big Sagebrush	Bedrock/Residium	0-20 cm.	Valley-Interior	2	Southeast	None	Hearth
26Ln3089	14	S3	Isolate	5900	0.00	Juniper-Pinyon, Yucca, Big Sagebrush	Alluvium	Surface	Slope-Face	3	Southeast	None	
26Ln3090	14	S3	Isolate	6000	0.00	Juniper-Pinyon, Yucca, Big Sagebrush	Bedrock/Residium	Surface	Ridge-Face	20	Southwest	None	

Table 5-1: Selected cultural and environmental attributes of Cultural Resources in the Groom Range, Lincoln County, Nevada. (cont'd)

Site Number	Quadrat	CRES Rating	Site Type	Elevation	Area (Ares)	Dominant Vegetation	Substrate	Potential Depth	Primary Landform	Slope Degrees	Aspect	Diagnostics	Features
26Ln3091	14	S3	Ranching	6000	4.71	Juniper-Pinyon, Yucca	Bedrock/Residium	Surface	Valley-Interior	2	East	Historic	
26Ln3092	14	S3	Lithic Scatter	6000	0.00	Juniper-Pinyon, Yucca, Big Sagebrush	Bedrock/Residium	Surface	Ridge-Top	2	Northwest	None	
26Ln3093	NA	S3	Temporary Camp	4550	1.17	Pinyon-Juniper, Yucca	Bedrock/Alluvium	20-100 cm.	Foothill-Face	0	North	Brownware	Rockshelter
26Ln3094	15	S2	Temporary Camp Rock Art	6575	1570.79	Pinyon-Juniper, Yucca	Bedrock/Alluvium	>100 cm.	Foothill-Face	0	Northeast	3 Brownware/1 Anasazi/ 3 Rosegate/2 Elko/ 2 Gatecliff/1 Pinto/ 1 Humboldt/1 Lg. Side-Notched	Rock Circle, Hearth, Rock Art
26Ln3095	NA	S3	Temporary Camp Milling Station	7100	2.35	Pinyon-Juniper, Big Sagebrush	Colluvium/Bedrock	0-20 cm.	Ridge-Toe	5	South	None	Rockshelter
26Ln3096	13	S3	Temporary Camp	7350	7.06	Pinyon-Juniper, Big Sagebrush	Residium/Aeolian	0-20 cm.	Ridge-Top	2	Northeast	None	Rock Circle
26Ln3097	NA	S1	Temporary Camp Other Prehistoric	6800	109.95	Pinyon-Juniper, Jointfir	Colluvium/Bedrock	>100 cm.	Slope-Interior	22	North	Historic/Anasazi/Rosegate	9 Rockshelters, Rock Art
26Ln3098	13	S3	Locality	7250	1.57	Pinyon-Juniper, Big Sagebrush	Residium/Aeolian	0-20 cm.	Ridge-Top	3	Southeast	None	
26Ln3099	19	S3	Isolate	7175	0.00	Pinyon, Big Sagebrush	Colluvium	Surface	Slope-Face	4	North	None	
26Ln3100	19	S3	Locality	7250	2.35	Pinyon, Big Sagebrush	Colluvium	Surface	Ridge-Toe	2	North	None	
26Ln3101	19	S3	Isolate	7100	0.00	Pinyon, Big Sagebrush	Colluvium	Surface	Slope-Face	2	North	Historic	
26Ln3102	19	S3	Locality Milling Station	7300	0.11	Pinyon, Big Sagebrush	Alluvium/Colluvium	Surface	Valley-Bottom	4	North	None	
26Ln3103	19	S3	Locality	7400	0.03	Pinyon, Big Sagebrush	Alluvium	Surface	Valley-Edge	7	East	None	
26Ln3104	19	S3	Cache	7300	0.07	Pinyon, Big Sagebrush	Residium/Colluvium	0-20 cm.	Ridge-Top	15	East	None	Rock Circle
26Ln3105	NA	S2	Temporary Camp Transportation	7500	14.13	Pinyon, Big Sagebrush	Residium/Colluvium	0-20 cm.	Ridge-Top	15	Northeast	Historic	Road
26Ln3106	20	S3	Lithic Scatter	6500	176.71	Pinyon-Juniper, Yucca, Big Sagebrush	Alluvium	Surface	Fan-Face	9	Southeast	Rosegate/Elko	
26Ln3107	20	S3	Lithic Scatter	6375	4.71	Pinyon-Juniper, Yucca, Big Sagebrush	Alluvium	Surface	Fan-Face	3	East	Desert	
26Ln3108	20	S3	Isolate	6300	0.00	Pinyon-Juniper, Yucca, Big Sagebrush	Alluvium	Surface	Fan-Face	3	Southeast	None	

Table 5-1: Selected cultural and environmental attributes of Cultural Resources in the Groom Range, Lincoln County, Nevada. (cont'd)

Site Number	Quadrat	CRES Rating	Site Type	Elevation	Area (Ares)	Dominant Vegetation	Substrate	Potential Depth	Primary Landform	Slope Degrees	Aspect	Diagnostics	Features
26Ln3109	21	S3	Locality	5600	9.81	Juniper-Pinyon, Sagebrush	Alluvium	Surface	Fan-Face	3	Northeast	None	
26Ln3110	21	S4	Isolate	5800	0.00	Juniper-Pinyon, Sagebrush	Alluvium	Surface	Fan-Face	3	East	Rosegate	
26Ln3111	20	S3	Lithic Scatter	6300	23.56	Pinyon-Juniper, Yucca, Big Sagebrush	Alluvium	Surface	Fan-Face	6	East	None	
26Ln3112	20	S3	Isolate	6390	0.00	Pinyon-Juniper, Yucca, Big Sagebrush	Alluvium	Surface	Fan-Face	3	South	None	
26Ln3113	NA	S3	Locality	7400	0.04	Pinyon-Juniper, Big Sagebrush	Colluvium/Residium	0-20 cm.	Ridge-Top	11	Southwest	None	
26Ln3114	NA	S3	Cache	7650	0.16	Pinyon, White Fir, Big Sagebrush	Alluvium	Surface	Valley-Head	5	East	None	Rock Circle
26Ln3115	NA	S3	Cache	7850	0.06	Pinyon, White Fir, Big Sagebrush	Alluvium	Surface	Valley-Head	5	East	None	Rock Circle
26Ln3116	NA	S3	Cache	7675	0.06	Pinyon, White Fir, Big Sagebrush	Alluvium	Surface	Valley-Head	5	East	None	Rock Circle
26Ln3117	NA	S3	Temporary Camp	8775	35.34	Pinyon, White Fir, Big Sagebrush	Residium/Aeolian	0-20 cm.	Ridge-Top	0	Northeast	Anasazi/Elko	
26Ln3118	NA	S3	Locality Temporary Camp	8600	0.28	Pinyon, White Fir, Big Sagebrush	Residium/Colluvium	0-20 cm.	Ridge-Top	2	Southwest	Gatecliff	
26Ln3119	NA	S3	Locality	7300	4.71	Pinyon, Big Sagebrush	Alluvium/Bedrock	0-20 cm.	Ridge-Toe	10	East	Historic	Cache, Rock Circle
26Ln3120	26	S3	Temporary Camp	7800	14.13	Pinyon, Big Sagebrush	Residium/Aeolian	0-20 cm.	Ridge-Top	4	Southeast	None	
26Ln3121	26	S1	Temporary Camp	7500	1079.92	Pinyon, Big Sagebrush	Alluvium/Colluvium	0-20 cm.	Valley-Bottom	5	East	Historic	Rockshelter
26Ln3122	NA	S3	Locality	8800	2.35	White Fir, Pinyon, Big Sagebrush	Residium/Colluvium	0-20 cm.	Ridge-Top	2	South	None	
26Ln3123	28	S2	Temporary Camp Lithic Scatter	6600	113.09	Pinyon-Juniper, Big Sagebrush	Alluvium/Colluvium	Surface	Fan-Face	5	Southeast	1 Elko/2 Pinto	
26Ln3124	28	S2	Temporary Camp Ranching	6600	659.73	Pinyon-Juniper, Big Sagebrush	Alluvium/Colluvium	Surface	Spring/Seep-Edge	10	East	1 Brownware/2 Anasazi/ 1 Rosegate/1 Elko	
26Ln3125	29	S3	Lithic Scatter Opportunistic Quarry	5935	32.98	Pinyon-Juniper, Big Sagebrush	Alluvium	Surface	Fan-Base	2	East	Gatecliff	

Table 5-1: Selected cultural and environmental attributes of Cultural Resources in the Groom Range, Lincoln County, Nevada. (cont'd)

Site Number	Quadrat	CRES Rating	Site Type	Elevation	Area (Ares)	Dominant Vegetation	Substrate	Potential Depth	Primary Landform	Slope Degrees	Aspect	Diagnostics	Features
26Ln3126	29	S3	Temporary Camp	5950	4.90	Pinyon-Juniper, Big Sagebrush	Alluvium	Surface	Fan-Face	3	Northeast	Brownware	
26Ln3127	29	S3	Lithic Scatter	5925	150.79	Pinyon-Juniper, Big Sagebrush	Alluvium	Surface	Fan-Base	3	Northeast	Historic/Brownware/Pinto	
26Ln3128	NA	S3	Ranching	5600	3.14	Pinyon-Juniper, Big Sagebrush	Alluvium	20-100 cm.	Valley-Bottom	2	North	Historic	Cleared Area
26Ln3129	NA	S3	Temporary Camp Milling Station	5600	0.06	Juniper, Pinyon, Big Sagebrush	Residium/Alluvium	20-100 cm.	Cliff-Face	15	North	Historic/Brownware/Elko	
26Ln3130	29	S3	Knapping Station	5900	0.01	Pinyon-Juniper, Big Sagebrush	Alluvium/Bedrock	Surface	Fan-Base	4	East	None	
26Ln3131	34	S3	Isolate	5800	0.00	Juniper-Pinyon, Yucca, Big Sagebrush	Colluvium/Bedrock	Surface	Slope-Base	3	Southwest	None	
26Ln3132	NA	S3	Locality	8460	2.19	Pinyon, White Fir, Big Sagebrush	Residium/Bedrock	0-20 cm.	Ridge-Top	1	East	None	
26Ln3133	30	S3	Temporary Camp	8400	65.97	Pinyon, White Fir, Juniper, Sagebrush	Colluvium/Bedrock	Surface	Saddle-Top	0	Northeast	3 Elko/1 Humboldt/1 Basal-Notched	
26Ln3134	NA	S3	Temporary Camp	8200	7.06	Pinyon, Oak, Juniper, Bitterbrush	Colluvium/Residium	0-20 cm.	Saddle-Edge	10	North	Rosegate	
26Ln3135	35	S2	Temporary Camp Rock Art	7200	981.74	Pinyon, Oak, Juniper, Bitterbrush	Bedrock/Residium	Surface	Valley-Interior	0	Southwest	Elko	Cache, Rock Art
26Ln3136	NA	S3	Isolate	8200	0.00	Pinyon, Oak, White Fir, Big Sagebrush	Colluvium	Surface	Saddle-Edge	8	North	None	
26Ln3137	37	S3	Lithic Scatter	6300	0.00	Juniper-Pinyon, Big Sagebrush	Alluvium	Surface	Fan-Face	5	East	Brownware/Pinto	
26Ln3138	NA	S4	Isolate	5700	0.00	Big Sagebrush	Alluvium	Surface	Valley-Edge	3	East	None	
26Ln3139	NA	S4	Isolate	5700	0.00	Big Sagebrush	Alluvium	Surface	Valley-Edge	3	Northwest	None	
26Ln3140	41	S3	Isolate	6300	0.00	Juniper-Pinyon, Yucca, Blackbrush	Alluvium	Surface	Fan-Face	2	Northeast	None	
26Ln3141	41	S3	Locality	6300	0.34	Juniper-Pinyon, Yucca, Blackbrush	Alluvium	Surface	Fan-Face	2	Northeast	Historic	
26Ln3142	NA	S3	Ranching Other Historic	6750	0.03	Juniper-Pinyon, Big Sagebrush	Colluvium/Bedrock	Surface	Cliff-Base	23	Southeast	Historic	Improved Spring, Well

Table 5-1: Selected cultural and environmental attributes of Cultural Resources in the Groom Range, Lincoln County, Nevada. (cont'd)

Site Number	Quadrat	CRES Rating	Site Type	Elevation	Area (Ares)	Dominant Vegetation	Substrate	Potential Depth	Primary Landform	Slope Degrees	Aspect	Diagnostics	Features
26Ln3143	NA	S3	Temporary Camp	6650	0.37	Juniper-Pinyon, Squaw Bush, Jointflr	Colluvium/Aeolian	20-100 cm.	Cliff-Base	23	Southeast	Rosegate	Rockshelter
26Ln3144	NA	S2	Temporary Camp	6575	147.26	Juniper-Pinyon, Big Sagebrush	Colluvium/Alluvium	0-20 cm.	Ridge-Top	4	South	None	
26Ln3145	41	S2	Lithic Scatter	6350	441.78	Juniper-Pinyon, Yucca, Blackbrush	Alluvium	Surface	Fan-Face	0	East	None	Depression
26Ln3146	NA	S4	Isolate	6200	0.00	Juniper-Pinyon, Yucca, Blackbrush	Alluvium	Surface	Ridge-Face	0	South	None	Rock Circle
26Ln3147	41	S3	Locality	6180	0.94	Juniper, Cliffrose	Alluvium	Surface	Fan-Face	3	North	Brownware	
26Ln3148	41	S3	Isolate	6250	0.00	Juniper-Pinyon, Yucca, Blackbrush	Alluvium	Surface	Fan-Face	2	North	None	
26Ln3149	41	S3	Isolate	6175	0.00	Juniper-Pinyon, Yucca, Blackbrush	Alluvium	Surface	Fan-Face	2	East	None	
26Ln3150	41	S3	Locality	6200	0.01	Blackbrush	Alluvium	Surface	Fan-Face	2	East	None	
26Ln3151	41	S3	Locality	6225	0.03	Big Sagebrush		Surface	Fan-Face	2	Southeast	None	
26Ln3152	41	S3	Isolate	6275	0.00	Juniper-Pinyon, Yucca, Blackbrush	Alluvium	Surface	Fan-Face	2	Southeast	None	
26Ln3153	41	S3	Isolate	6225	0.00	Juniper-Pinyon, Yucca, Blackbrush	Alluvium	Surface	Fan-Face	2	Northeast	None	
26Ln3154	42	S3	Isolate	5700	0.00	Juniper, Joshua Tree, Big Sagebrush	Alluvium	Surface	Fan-Face	2	Northeast	None	
26Ln3155	42	S3	Isolate	5725	0.00	Juniper, Joshua Tree, Big Sagebrush	Alluvium	Surface	Fan-Face	2	Northeast	None	
26Ln3156	42	S3	Locality Ranching	5600	1.88	Juniper, Joshua Tree, Big Sagebrush	Colluvium	Surface	Ridge-Base	2	Northeast	Historic/Rosegate	
26Ln3157	42	S4	Isolate	5690	0.00	Juniper, Joshua Tree, Big Sagebrush	Alluvium	Surface	Fan-Face	2	East	None	
26Ln3158	42	S3	Locality	5595	0.07	Juniper, Joshua Tree, Big Sagebrush	Alluvium	Surface	Fan-Face	2	South	None	
26Ln3159	42	S3	Lithic Scatter	5590	4.71	Juniper, Joshua Tree, Big Sagebrush	Alluvium	Surface	Fan-Face	2	Southwest	Rosegate	

Table 5-1: Selected cultural and environmental attributes of Cultural Resources in the Groom Range, Lincoln County, Nevada. (cont'd)

Site Number	Quadrat	CRES Rating	Site Type	Elevation	Area (Ares)	Dominant Vegetation	Substrate	Potential Depth	Primary Landform	Slope Degrees	Aspect	Diagnostics	Features
26Ln3160	42	S3	Isolate	5600	0.00	Juniper, Joshua Tree, Big Sagebrush	Alluvium	Surface	Fan-Face	2	Southeast	None	
26Ln3161	42	S4	Isolate	5750	0.00	Juniper, Joshua Tree, Big Sagebrush	Colluvium/Bedrock	Surface	Foothill-Interior	18	East	Elko	
26Ln3162	43	S3	Isolate	5600	0.00	Juniper, Yucca, Joshua Tree, Cliffrose	Colluvium/Bedrock	Surface	Slope-Interior	14	East	None	
26Ln3163	43	S3	Lithic Scatter Quarry	5540	2.94	Juniper, Yucca, Joshua Tree, Cliffrose	Colluvium/Bedrock	Surface	Saddle-Interior	0	North	None	
26Ln3164	47	S3	Isolate	5800	0.00	Juniper-Pinyon, Joshua Tree, Blackbrush	Colluvium/Bedrock	Surface	Valley-Edge	4	South	None	
26Ln3165	47	S3	Locality	5800	0.03	Juniper-Pinyon, Joshua Tree, Blackbrush	Alluvium/Bedrock	0-20 cm.	Valley-Edge	5	South	None	
26Ln3166	47	S3	Milling Station Isolate	5800	0.00	Juniper-Pinyon, Joshua Tree, Blackbrush	Colluvium/Bedrock	Surface	Valley-Edge	6	East	None	
26Ln3167	47	S3	Isolate	5800	0.00	Juniper-Pinyon, Joshua Tree, Blackbrush	Colluvium/Bedrock	Surface	Valley-Edge	5	South	None	
26Ln3168	NA	S3	Lithic Scatter	6700	14.13	Pinyon-Juniper, Big Sagebrush	Alluvium/Colluvium	0-20 cm.	Ridge-Top	4	North	None	
26Ln3169	48	S3	Other Historic	6525	0.00	Juniper-Pinyon, Winterfat	Alluvium/Bedrock	Surface	Valley-Bottom	0	Southwest	Historic	Road, Hearth, Cairn
26Ln3170	22	S2	Quarry Mining	5500	70.68	Juniper, Yucca, Big Sagebrush	Bedrock/Residium	Surface	Slope	10	Northeast	None	Prospect
26Ln3171	NA	S3	Locality	6700	2.82	Pinyon-Juniper, Winterfat	Colluvium	Surface	Saddle-Bottom	4	South	None	
26Ln3172	51	S3	Isolate	5700	0.00	Joshua Tree, Juniper, Blackbrush	Alluvium	Surface	Fan-Interior	4	Southeast	None	
26Ln3173	52	S3	Lithic Scatter	6150	4.71	Joshua Tree, Juniper, Blackbrush	Alluvium	Surface	Fan-Face	0	East	None	
26Ln3174	NA	S3	Locality Opportunistic Quarry	5310	157.07	Yucca, Blackbrush	Alluvium	0-20 cm.	Fan-Interior	5	East	None	
26Ln3175	56	S3	Isolate	5250	0.00	Joshua Tree, Juniper, Blackbrush	Alluvium	Surface	Fan-Face	2	West	None	

Table 5-1: Selected cultural and environmental attributes of Cultural Resources in the Groom Range, Lincoln County, Nevada. (cont'd)

Site Number	Quadrat	CRES Rating	Site Type	Elevation	Area (Ares)	Dominant Vegetation	Substrate	Potential Depth	Primary Landform	Slope Degrees	Aspect	Diagnostics	Features
26Ln3176	56	S3	Lithic Scatter Opportunistic Quarry	5250	0.94	Joshua Tree, Juniper, Blackbrush	Alluvium	Surface	Saddle-Interior	2	Southeast	None	
26Ln3177	56	S3	Isolate	5750	0.00	Joshua Tree, Juniper, Blackbrush	Alluvium	Surface	Ridge-Top	3	North	None	
26Ln3178	56	S3	Isolate	5325	0.00	Joshua Tree, Juniper, Blackbrush	Alluvium	Surface	Ridge-Top	2	Northeast	None	
26Ln3179	53	S3	Locality	5340	0.00	Joshua Tree, Yucca, Pinyon, Blackbrush	Alluvium	Surface	Alluv. Terrace-Edge	2	Southeast	None	
26Ln3180	58	S3	Locality	5500	0.16	Joshua Tree, Yucca, Big Sagebrush	Colluvium/Bedrock	Surface	Fan-Face	5	South	None	
26Ln3181	58	S3	Isolate	5500	0.00	Joshua Tree, Yucca, Big Sagebrush	Colluvium/Bedrock	Surface	Fan-Face	7	South	None	
26Ln3182	NA	S4	Isolate	5200	0.00	Joshua Tree, Yucca, Juniper, Big Sagebrush	Alluvium	Surface	Fan-Face	2	Southeast	None	
26Ln3183	61	S3	Knapping Station	5100	1.76	Joshua Tree, Yucca, Juniper, Big Sagebrush	Bedrock/Colluvium	Surface	Knoll-Apex	3	Southwest	None	
26Ln3184	61	S3	Isolate	5100	0.00	Joshua Tree, Yucca, Juniper, Big Sagebrush	Bedrock/Colluvium	Surface	Knoll-Base	4	West	None	
26Ln3185	NA	S3	Locality	6100	1.76	Juniper-Pinyon, Yucca, Blackbrush	Colluvium/Residium	0-20 cm.	Ridge-Top	10	South	None	
26Ln3186	NA	S2	Temporary Camp Ranching	5400	565.48	Juniper, Yucca, Big Sagebrush	Alluvium/Aeolian	0-20 cm.	Ridge	8	West	None	Improved Spring, Well
26Ln3187	68	S3	Lithic Scatter	5600	4.71	Joshua Tree, Yucca	Bedrock/Residium	Surface	Ridge-Top	24	West	None	
26Ln3188	68	S3	Locality	5400	0.37	Joshua Tree, Yucca	Bedrock/Residium	Surface	Slope-Interior	28	West	None	2 Rockshelters
26Ln3189	68	S3	Locality	5500	2.74	Joshua Tree, Yucca	Bedrock/Alluvium	Surface	Foothill-Interior	0	South	None	
26Ln3190	68	S3	Quarry	5600	21.20	Joshua Tree, Yucca	Residium/Colluvium	0-20 cm.	Ridge-Face	20	South	None	
26Ln3191	68	S4	Isolate	5450	0.00	Joshua Tree, Yucca	Residium/Colluvium	Surface	Ridge-Top	16	South	None	
26Ln3192	68	S3	Locality	5350	0.07	Joshua Tree, Yucca	Bedrock/Residium	Surface	Ridge-Top	10	Southwest	None	
26Ln3193	68	S3	Knapping Station	5300	0.15	Joshua Tree, Yucca	Bedrock/Residium	0-20 cm.	Ridge-Top	2	West	None	
26Ln3194	68	S3	Lithic Scatter	5300	14.13	Joshua Tree, Yucca	Residium/Colluvium	0-20 cm.	Saddle	5	East	None	

Table 5-1: Selected cultural and environmental attributes of Cultural Resources in the Groom Range, Lincoln County, Nevada. (cont'd)

Site Number	Quadrat	CRES Rating	Site Type	Elevation	Area (Ares)	Dominant Vegetation	Substrate	Potential Depth	Primary Landform	Slope Degrees	Aspect	Diagnostics	Features
26Ln3195	66	S3	Locality	5400	0.23	Yucca, Blackbrush	Alluvium	Surface	Fan-Face	1	South	None	
26Ln3196	66	S3	Locality	5400	7.06	Yucca, Blackbrush	Alluvium	Surface	Fan-Face	1	South	None	
26Ln3197	66	S3	Knapping Station	5400	0.11	Joshua Tree, Blackbrush	Alluvium	Surface	Fan-Face	1	South	None	
26Ln3198	NA	S3	Quarry Knapping Station	5200	19.63	Joshua Tree, Blackbrush	Alluvium/Bedrock	Surface	Foothill-Face	11	West	None	
26Ln3199	70	S3	Lithic Scatter	5150	245.43	Joshua Tree, Yucca, Horsebrush	Colluvium	Surface	Slope-Face	2	Northwest	None	
26Ln3200	70	S3	Lithic Scatter	5150	2.19	Joshua Tree, Horsebrush	Alluvium	Surface	Slope-Face	2	Northwest	None	
26Ln3201	70	S3	Lithic Scatter	5150	2.82	Joshua Tree, Yucca, Blackbrush	Colluvium	Surface	Slope-Face	2	West	None	
26Ln3202	70	S4	Isolate	5150	0.00	Joshua Tree, Yucca, Blackbrush	Colluvium	Surface	Slope-Face	3	West	None	
26Ln3203	70	S4	Isolate	5150	0.00	Joshua Tree, Horsebrush	Colluvium	Surface	Slope-Face	5	West	None	
26Ln3204	69	S3	Lithic Scatter	5400	4.71	Joshua Tree, Horsebrush	Aeolian/Alluvium	20-100 cm.	Valley-Edge	6	East	None	
26Ln3205	69	S3	Locality	5380	0.28	Joshua Tree, Horsebrush	Aeolian/Alluvium	0-20 cm.	Valley-Edge	4	East	None	
26Ln3206	69	S3	Lithic Scatter	5380	0.58	Joshua Tree, Big Sagebrush	Aeolian/Alluvium	0-20 cm.	Valley-Edge	2	Northeast	None	
26Ln3207	69	S3	Isolate	5300	0.00	Joshua Tree, Horsebrush	Aeolian/Alluvium	Surface	Valley-Edge	4	North	None	
26Ln3208	70	S3	Lithic Scatter	5150	0.70	Joshua Tree, Yucca, Blackbrush	Colluvium	Surface	Slope-Face	2	East	None	
26Ln3209	NA	S3	Lithic Scatter	5150	1.57	Joshua Tree, Yucca, Blackbrush	Alluvium	Surface	Slope-Face	2	Southwest	None	
26Ln3210	70	S4	Isolate	5150	0.00	Joshua Tree, Yucca, Blackbrush	Colluvium	Surface	Slope-Face	2	East	None	
26Ln3211	72	S3	Knapping Station	5100	0.19	Joshua Tree, Yucca, Blackbrush	Alluvium	Surface	Fan-Face	2	South	None	
26Ln3212	72	S3	Isolate	5200	0.00	Joshua Tree, Yucca, Blackbrush	Alluvium	Surface	Fan-Face	2	South	None	
26Ln3213	75	S3	Isolate	5000	0.00	Joshua Tree, Yucca, Shadscale	Alluvium	Surface	Fan-Interior	3	Southwest	None	

Table 5-1: Selected cultural and environmental attributes of Cultural Resources in the Groom Range, Lincoln County, Nevada. (cont'd)

Site Number	Quadrat	CRES Rating	Site Type	Elevation	Area (Ares)	Dominant Vegetation	Substrate	Potential Depth	Primary Landform	Slope Degrees	Aspect	Diagnostics	Features
26Ln3214	75	S3	Lithic Scatter	4810	31.41	Joshua Tree, Shadscale	Alluvium	0-20 cm.	Fan-Interior	4	South	None	
26Ln3215	6B	S3	Lithic Scatter	5200	0.28	Joshua Tree, Yucca	Residium/Colluvium	0-20 cm.	Ridge-Toe	7	South	None	
26Ln3216	75	S3	Knapping Station Opportunistic Quarry	4900	0.03	Joshua Tree, Blackbrush	Alluvium	0-20 cm.	Fan-Interior	4	Southwest	None	
26Ln3217	75	S3	Lithic Scatter Opportunistic Quarry	4900	0.06	Joshua Tree, Yucca, Shadscale	Alluvium	0-20 cm.	Fan-Interior	4	Southwest	None	
26Ln3218	NA	S2	Transportation	4800	1413.71		Alluvium	0-20 cm.	Bajada-Top	3	South	None	Road
26Ln3219	80	S3	Lithic Scatter	4600	2748.89	Joshua Tree, Horsebrush	Aeolian/Alluvium	Surface	Bajada-Interior	3	Southwest	None	
26Ln3220	82	S3	Lithic Scatter	4650	4.28	Joshua Tree, Blackbrush	Aeolian/Alluvium	Surface	Bajada-Interior	2	Southwest	None	
26Ln3221	82	S3	Locality	4650	1.17	Joshua Tree, Blackbrush	Aeolian/Alluvium	Surface	Bajada-Interior	2	Southwest	None	
26Ln3222	82	S3	Lithic Scatter	4650	1.57	Joshua Tree, Blackbrush	Aeolian/Alluvium	Surface	Bajada-Interior	2	Southwest	None	
26Ln3223	82	S3	Lithic Scatter	4650	28.27	Joshua Tree, Blackbrush	Aeolian/Alluvium	Surface	Bajada-Interior	2	Southwest	None	
26Ln3224	82	S3	Lithic Scatter	4625	2.67	Joshua Tree, Blackbrush	Aeolian/Alluvium	0-20 cm.	Bajada-Interior	2	Southwest	None	
26Ln3225	NA	S3	Lithic Scatter	4625	1.76	Joshua Tree, Blackbrush	Aeolian/Alluvium	Surface	Bajada-Interior	2	Southwest	None	
26Ln3226	83	S3	Isolate	4700	0.00	Joshua Tree, Lepidium	Alluvium	Surface	Fan-Face	1	Southwest	None	
26Ln3227	83	S3	Isolate	4700	0.00	Joshua Tree, Lepidium	Alluvium	Surface	Fan-Face	2	West	None	
26Ln3228	83	S3	Isolate	4700	0.00	Joshua Tree, Lepidium	Alluvium	Surface	Fan-Face	3	Southeast	None	
26Ln3229	83	S3	Knapping Station	4700	0.06	Joshua Tree, Lepidium	Alluvium	Surface	Fan-Face	2	West	None	
26Ln3230	83	S3	Locality	4700	0.04	Joshua Tree, Lepidium	Alluvium	Surface	Fan-Face	2	Northwest	None	
26Ln3231	83	S3	Locality	4700	0.02	Joshua Tree, Lepidium	Alluvium	Surface	Fan-Face	1	West	None	
26Ln3232	83	S3	Isolate	4700	0.00	Joshua Tree, Lepidium	Alluvium	Surface	Fan-Face	1	West	None	
26Ln3233	83	S3	Isolate	4700	0.00	Joshua Tree, Lepidium	Alluvium	Surface	Fan-Face	1	West	None	
26Ln3234	83	S3	Isolate	4700	0.00	Joshua Tree, Lepidium	Alluvium	Surface	Fan-Face	1	South	None	
26Ln3235	83	S3	Knapping Station	4700	0.09	Joshua Tree, Lepidium	Alluvium	Surface	Fan-Face	1	West	None	
26Ln3236	83	S3	Isolate	4700	0.00	Joshua Tree, Lepidium	Alluvium	Surface	Fan-Face	1	Northwest	None	

Table 5-1: Selected cultural and environmental attributes of Cultural Resources in the Groom Range, Lincoln County, Nevada. (cont'd)

Site Number	Quadrat	CRES Rating	Site Type	Elevation	Area (Ares)	Dominant Vegetation	Substrate	Potential Depth	Primary Landform	Slope Degrees	Aspect	Diagnostics	Features
26Ln3237	NA	S3	Milling Station Isolate	4800	0.00		Allovium	Surface	Bajada-Interior	3	Southwest	None	
26Ln3238	77	S3	Isolate	4800	0.00	Joshua Tree, Blackbrush	Alluvium/Aeolian	Surface	Fan-Face	5	Southwest	None	
26Ln3239	77	S3	Isolate	4780	0.00	Joshua Tree, Blackbrush	Alluvium/Aeolian	Surface	Fan-Face	3	Southwest	None	
26Ln3240	77	S3	Locality	4820	0.00	Joshua Tree, Blackbrush	Alluvium/Aeolian	Surface	Fan-Face	4	South	None	
26Ln3241	77	S3	Lithic Scatter	4790	54.97	Joshua Tree, Blackbrush	Alluvium/Aeolian	0-20 cm.	Fan-Face	3	Southwest	None	
26Ln3242	77	S3	Isolate	4780	0.00	Joshua Tree, Blackbrush	Alluvium	Surface	Fan-Toe	3	Southwest	None	
26Ln3243	84	S3	Isolate	4900	0.00	Joshua Tree, Blackbrush		Surface	Fan-Face	2	Southwest	None	
26Ln3244	84	S3	Isolate	4850	0.00	Joshua Tree, Blackbrush	Alluvium	Surface	Fan-Face	0	Southwest	None	
26Ln3245	84	S3	Isolate	4800	0.00	Joshua Tree, Blackbrush	Alluvium	Surface	Ridge-Face	3	Southwest	None	
26Ln3246	76	S3	Isolate	5500	0.00	Joshua Tree, Blackbrush	Residium/Aeolian	Surface	Ridge-Top	8	North	None	
26Ln3247	82	S3	Isolate	4700	0.00	Joshua Tree, Blackbrush	Aeolian/Alluvium	Surface	Bajada-Interior	2	Southwest	None	
26Ln3248	82	S2	Lithic Scatter Temporary Camp	4700	80.11	Joshua Tree, Blackbrush	Aeolian/Alluvium	0-20 cm.	Bajada-Interior	2	Southwest	Gatecliff	
26Ln3249	82	S3	Locality	4650	1.02	Joshua Tree, Blackbrush	Aeolian/Alluvium	Surface	Bajada-Interior	2	Southwest	None	
26Ln3250	86	S3	Locality	4440	0.23	Horsebrush	Alluvium	Surface	Playa-Edge	3	West	None	
26Ln3251	86	S3	Lithic Scatter	4460	8.48	Horsebrush	Alluvium	Surface	Playa-Edge	4	Southeast	None	
26Ln3252	86	S3	Lithic Scatter	4440	589.04	Horsebrush	Alluvium	Surface	Playa-Edge	2	Southwest	None	
26Ln3253	86	S3	Locality	4440	0.15	Horsebrush	Alluvium	Surface	Playa-Edge	1	North	None	
26Ln3254	86	S3	Locality	4440	0.07	Horsebrush	Alluvium	Surface	Playa-Edge	1	North	None	
26Ln3255	86	S3	Lithic Scatter	4440	2.35	Horsebrush	Alluvium	Surface	Playa-Edge	1	East	None	
26Ln3256	86	S4	Isolate	4450	0.00	Horsebrush	Alluvium	Surface	Playa-Edge	2	South	Elko	
26Ln3257	78	S3	Isolate	4510	0.00	Joshua Tree, Rabbitbrush	Alluvium/Aeolian	Surface	Bajada-Interior	3	Southwest	None	
26Ln3258	78	S3	Isolate	4440	0.00	Joshua Tree, Rabbitbrush	Alluvium/Aeolian	Surface	Bajada-Interior	3	Southwest	None	
26Ln3259	78	S3	Isolate	4450	0.00	Joshua Tree, Rabbitbrush	Alluvium/Aeolian	Surface	Bajada-Interior	3	Southwest	None	

Table 5-1: Selected cultural and environmental attributes of Cultural Resources in the Groom Range, Lincoln County, Nevada. (cont'd)

Site Number	Quadrat	CRES Rating	Site Type	Elevation	Area (Ares)	Dominant Vegetation	Substrate	Potential Depth	Primary Landform	Slope Degrees	Aspect	Diagnostics	Features
26Ln3260	78	S2	Transportation	4560	70.68	Joshua Tree, Rabbitbrush	Alluvium	Surface	Bajada-Interior	3	Southwest	Historic	Road
26Ln3261	78	S3	Lithic Scatter	4560	28.27	Joshua Tree, Rabbitbrush	Alluvium	0-20 cm.	Bajada-Interior	3	South	None	
26Ln3262	NA	S3	Temporary Camp	4800	4.71	Yucca, Joshua Tree, Cliffrose	Colluvium	0-20 cm.	Ridge-Face	20	North	None	Rockshelter
26Ln3263	79	S3	Locality	4440	0.11	Joshua Tree, Horsebrush	Alluvium	Surface	Playa-Edge	2	South	None	
26Ln3264	NA	S3	Cache	4880	0.00	Yucca, Joshua Tree, Cliffrose	Bedrock/Residium	Surface	Ridge-Face	45	West	None	Cache
26Ln3265	NA	S3	Locality Other Prehistoric	4980	0.00	Yucca, Joshua Tree, Cliffrose	Bedrock/Aeolian	Surface	Ridge-Top	2	East	None	Tinaja
26Ln3266	74	S3	Locality	4840	0.78	Yucca, Joshua Tree, Cliffrose	Alluvium	0-20 cm.	Fan-Interior	4	East	None	
26Ln3267	NA	S3	Mining Ranching	4960	0.00	Blackbrush	Colluvium/Alluvium	Surface	Foothill-Bottom	0	Southeast	Historic	Improved Spring, Earth Oven, Water Tank, Corral
26Ln3268	73	S3	Locality	4740	0.00	Yucca, Blackbrush	Alluvium	Surface	Fan-Interior	2	Southwest	None	
26Ln3269	73	S3	Isolate	4760	0.00	Yucca, Blackbrush	Alluvium	Surface	Fan-Interior	3	Southwest	None	
26Ln3270	73	S3	Isolate	4880	0.00	Yucca, Blackbrush	Alluvium	Surface	Fan-Interior	2	Southwest	None	
26Ln3271	73	S3	Mining	4800	0.00	Yucca, Blackbrush	Alluvium	Surface	Fan-Interior	2	South	None	Cairn
26Ln3272	73	S3	Isolate	4840	0.00	Yucca, Blackbrush	Alluvium	Surface	Fan-Face	2	South	None	
26Ln3273	73	S3	Locality Milling Station	4880	1.76	Yucca, Blackbrush	Alluvium/Colluvium	Surface	Foothill-Face	2	South	None	
26Ln3274	71	S3	Isolate	4910	0.00	Yucca, Blackbrush	Alluvium	Surface	Fan-Face	4	South	None	
26Ln3275	71	S3	Isolate	4920	0.00	Yucca, Blackbrush	Alluvium	Surface	Fan-Face	3	South	None	
26Ln3276	71	S3	Lithic Scatter	4880	20.02	Yucca, Blackbrush	Alluvium	Surface	Fan-Face	3	South	None	
26Ln3277	NA	S3	Mining Ranching	5000	0.00	Squaw Bush, Yucca,	Colluvium/Bedrock	Surface	Foothill-Bottom	0	Southeast	Historic	Water Tank, Shaft
26Ln3278	73	S4	Locality	4860	0.00	Yucca, Blackbrush	Alluvium	Surface	Fan-Face	3	Southwest	Brownware/Pinto	
26Ln3279	73	S3	Lithic Scatter Other Historic	4860	14.13	Yucca, Blackbrush	Alluvium	Surface	Fan-Interior	3	Southwest	Historic	Cairn

Table 5-1: Selected cultural and environmental attributes of Cultural Resources in the Groom Range, Lincoln County, Nevada. (cont'd)

Site Number	Quadrat	CRES Rating	Site Type	Elevation	Area (Ares)	Dominant Vegetation	Substrate	Potential Depth	Primary Landform	Slope Degrees	Aspect	Diagnostics	Features
26Ln3280	67	S3	Lithic Scatter	5160	392.69	Yucca, Blackbrush	Alluvium/Bedrock	Surface	Fan-Face	2	Southwest	None	
26Ln3281	67	S3	Isolate	5200	0.00	Yucca, Blackbrush	Alluvium/Bedrock	Surface	Fan-Face	5	Southwest	None	
26Ln3282	NA	S3	Mining	5090	47.12	Yucca, Blackbrush	Colluvium/Bedrock	>100 cm.	Valley-Bottom	3	South	Historic	Hoisting works, Cabin, Shaft
26Ln3283	NA	S1	Mining	5480	7068.59	Juniper, Yucca, Blackbrush	Colluvium/Bedrock	>100 cm.	Valley-Bottom	5	South	Historic	Hoisting works, Cabin, Shaft
26Ln3284	65	S3	Isolate	5560	0.00	Yucca, Juniper, Blackbrush	Bedrock/Residium	Surface	Ridge-Top	0	Northeast	None	
26Ln3285	65	S3	Locality	5480	1.17	Yucca, Juniper, Blackbrush	Residium/Colluvium	Surface	Interfluve-Interior	5	West	None	
26Ln3286	59	S4	Mining	5880	0.00	Big Sagebrush	Bedrock	Surface	Ridge-Top	0	North	None	
26Ln3287	49	S3	Locality	5680	0.78	Juniper, Yucca, Blackbrush	Alluvium	Surface	Alluv. Terr.-Interior	0	East	None	
26Ln3288	49	S3	Isolate	5640	0.00	Juniper, Yucca, Blackbrush	Alluvium	Surface	Alluv. Terr.-Interior	0	Northwest	None	
26Ln3289	44	S3	Isolate	5400	0.00	Yucca, Blackbrush	Alluvium	Surface	Peak-Face	6	North	None	
26Ln3290	39	S3	Lithic Scatter	6200	276.46	Juniper-Pinyon, Sagebrush	Alluvium	Surface	Foothill-Base	5	Southwest	None	
26Ln3291	39	S3	Lithic Scatter	6240	122.52	Juniper-Pinyon, Sagebrush	Alluvium	Surface	Foothill-Base	5	Southwest	None	
26Ln3292	39	S3	Lithic Scatter	6240	9.42	Juniper-Pinyon, Sagebrush	Alluvium	Surface	Foothill-Base	5	South	None	
26Ln3293	39	S3	Locality	6280	0.00	Juniper-Pinyon, Sagebrush	Alluvium	Surface	Foothill-Base	5	South	None	
26Ln3294	39	S3	Locality	6320	0.09	Juniper-Pinyon, Sagebrush	Alluvium	Surface	Foothill-Base	6	Northwest	None	
26Ln3295	40	S2	Lithic Scatter Mining	5885	1570.79	Juniper-Pinyon, Yucca, Big Sagebrush	Alluvium	Surface	Valley-Bottom	3	West	Pinto	Structure Platform
26Ln3296	NA	S2	Ranching Mining	5940	6.28	Juniper-Pinyon, Rabbitbrush	Alluvium	Surface	Floodplain-Base	2	South	Historic	Privy, Corral, 2 Cabins
26Ln3297	NA	S3	Temporary Camp	7300	0.00	Pinyon-Juniper, Sagebrush	Alluvium/Colluvium	20-100 cm.	Fan-Interior	3	Southwest	None	Rockshelter
26Ln3298	31	S3	Lithic Scatter	6200	47.12	Juniper-Pinyon, Yucca, Big Sagebrush	Colluvium/Alluvium	Surface	Valley-Bottom	3	West	None	
26Ln3299	25	S3	Isolate	6600	0.00	Juniper-Pinyon, Sagebrush	Alluvium	Surface	Fan-Face	0	North	Elko	
26Ln3300	25	S3	Locality	6650	0.27	Juniper-Pinyon, Sagebrush	Alluvium	Surface	Fan-Face	3	West	None	
26Ln3301	25	S3	Lithic Scatter	6640	3.14	Juniper-Pinyon, Sagebrush	Alluvium	Surface	Fan-Face	0	North	None	

Table 5-1: Selected cultural and environmental attributes of Cultural Resources in the Groom Range, Lincoln County, Nevada. (cont'd)

Site Number	Quadrat	CRES Rating	Site Type	Elevation	Area (Ares)	Dominant Vegetation	Substrate	Potential Depth	Primary Landform	Slope Degrees	Aspect	Diagnostics	Features
26Ln3320	6	S3	Isolate	6360	0.00	Joshua Tree, Juniper-Pinyon, Blackbrush	Colluvium	Surface	Ridge-Top	4	West	None	
26Ln3321	5	S3	Cache	7920	0.15	Pinyon-Juniper	Colluvium/Bedrock	Surface	Peak-Face	10	Northeast	None	Rock Circle
26Ln3322	5	S3	Cache Temporary Camp	7790	6.28	Pinyon-Juniper	Residium/Colluvium	0-20 cm.	Ridge-Top	4	Northwest	None	3 Rock Circles
26Ln3323	5	S3	Temporary Camp Milling Station	7600	14.13	Pinyon-Juniper	Residium/Colluvium	0-20 cm.	Ridge-Top	5	Northeast	None	Rock Circle
26Ln3324	3	S3	Locality	6720	0.04	Pinyon-Juniper, Big Sagebrush	Residium/Colluvium	Surface	Saddle-Interior	0	North	None	
26Ln3325	NA	S3	Locality	6620	589.04	Pinyon-Juniper, Big Sagebrush	Alluvium/Aeolian	0-20 cm.	Ridge-Top	4	West	Pinto	
26Ln3326	2	S3	Lithic Scatter	7200	25.13	Pinyon, Sagebrush	Alluvium	Surface	Foothill-End	0	West	None	
26Ln3327	2	S3	Locality	7240	0.31	Pinyon, Sagebrush	Colluvium/Alluvium	Surface	Ridge-Face	5	Southwest	None	
26Ln3328	2	S3	Knapping Station	7220	0.03	Pinyon, Sagebrush	Colluvium/Alluvium	Surface	Ridge-Face	4	South	None	
26Ln3329	2	S3	Locality	7160	0.78	Pinyon, Sagebrush	Colluvium/Alluvium	Surface	Ridge-Face	2	Southwest	Desert	
26Ln3330	NA	S3	Ranching Locality	6440	39.26	Juniper-Pinyon, Big Sagebrush	Alluvium/Aeolian	0-20 cm.	Valley-Bottom	3	North	Historic	Pipeline, Well, Improved Spring, Water Tank, Corral, Road
26Ln3331	PL*	S2	Temporary Camp	7800	157.07	Pinyon, Big Sagebrush	Colluvium/Alluvium	20-100 cm.	Mountain-Side	11	Northwest	Grayware/Rosegate/Elko	Rock Circle
26Ln3332	PL	S3	Locality	6720	0.78	Pinyon, Big Sagebrush	Colluvium	0-20 cm.	Mountain-Side	5	West	None	
26Ln3333	PL	S3	Isolate	6920	0.00	Juniper-Pinyon, Sagebrush	Alluvium/Colluvium	Surface	Mountain-Side	4	West	None	
26Ln3334	PL	S3	Isolate	6820	0.00	Juniper-Pinyon, Sagebrush	Alluvium/Colluvium	Surface	Mountain-Side	4	West	None	
26Ln3335	PL	S3	Isolate	6840	0.00	Juniper-Pinyon, Sagebrush	Alluvium/Colluvium	Surface	Mountain-Side	4	West	None	
26Ln3336	PL	S3	Lithic Scatter	5780	942.47	Juniper-Pinyon, Big Sagebrush	Alluvium/Colluvium	0-20 cm.	Mountain-Base	1	West	Historic	
26Ln3337	PL	S3	Locality	6000	9.42	Juniper-Pinyon, Big Sagebrush	Alluvium/Colluvium	0-20 cm.	Mountain-Side	4	South	None	

*PL indicates sites found on powerline survey

Table 5-1: Selected cultural and environmental attributes of Cultural Resources in the Groom Range, Lincoln County, Nevada. (cont'd)

Site Number	Quadrat	CRES Rating	Site Type	Elevation	Area (Ares)	Dominant Vegetation	Substrate	Potential Depth	Primary Landform	Slope Degrees	Aspect	Diagnostics	Features
26Ln3338	PL*	S3	Locality	6200	6.28	Juniper-Pinyon, Big Sagebrush	Colluvium/Alluvium	0-20 cm.	Mountain-Side	6	West	None	
26Ln3339	PL	S3	Locality	6490	9.42	Juniper-Pinyon	Residium/Colluvium	0-20 cm.	Mountain-Side	2	North	None	
26Ln3340	PL	S3	Locality	6490	1.96	Juniper-Pinyon, Big Sagebrush	Colluvium/Alluvium	Surface	Mountain-Side	4	Southwest	None	

*PL indicates sites found on powerline survey exploited resources (Thomas 1983:41-47). Hence, toolstone quarries are likely to produce more concentrated and dense artifact distributions than might be expected in zones of seed procurement. In fact, the extraction of certain resources might involve artifacts of a highly perishable nature and, hence, are invisible in an ancient archaeological record.

In order to implement this sort of classification nine functional indicators were defined for each archaeological site: (1) food preparation, (2) specialized tasks, (3) biface manufacture, (4) adornment or other personal paraphernalia, (5) hunting activities, (6) evidence of habitation, (7) evidence of caches, (8) density of debitage and (9) diversity in toolstone types. Bettinger (1975:80-91) has used similar, but not identical, activity assemblages based on ethnographic analogs for his research in Owens Valley. Manos, millingstones and pottery were interpreted to reflect food preparation activities, although these artifacts might have been secondarily used for other purposes. Utilized flakes, unifacially retouched artifacts, choppers, drills, and pressure retouched bifacial artifacts (Stage IV) were all considered signifiers of special activities such as tool and facility manufacture and maintenance or resource (faunal and floral) procurement and processing. The occurrence of bifacial stage forms at archaeological sites on the Groom Range were coded under biface manufacture; however, here it should be remembered that these artifacts may also indicate finished tools used in specialized activities. Articles of adornment and other personal paraphernalia were not commonly found at the archaeological sites in the overview area, but pendants have been recorded from sites 26Ln3084, 26Ln3094, 26Ln3182, and 26Ln3310. Although projectile points may occur in a variety of functional site types, their primary function was as weapon for hunting. Consequently, they have been coded as indicating hunting activities. In addition, those rock circle features that have been interpreted above to reflect hunting blinds also were coded as hunting activity indicators. Evidence of habitation included, rock rings interpreted to reflect habitation structures, rockshelters and hearths. Finally, rock rings interpreted to have been pinyon caches or roasting ovens and certain rock alignments found in the interior of rockshelters were coded under caches. The density of debitage at each archaeological site, presented as flakes per square meter, was calculated from data collected during the debitage sampling procedure described above or by tallying all debitage found at a site and dividing by that site's overall size. When more than one concentration of debitage occurred at an archaeological site, the densities of all concentrations were averaged for that site. Finally total diversity in toolstone at each cultural resource was calculated by simply summing all toolstone types that occurred at that site.

Residential Bases

Winter residential bases are the most intensively used site type present in the usual model for aboriginal settlement patterns in the Great Basin (Steward 1938). The ideal locations in the Groom Range for residential bases are in environmental zones near permanent water that offer a diversity of potential resources. Most major springs in the Groom Range occur at middle elevations. This places the springs within the pinyon-juniper vegetation zone with its critical pinyon resources. The middle elevations are also the zone of heaviest winter use by deer.

Sagebrush communities with the rich association of grasses are also within a short distance of most springs.

There is little doubt that winter residential bases were present near many of the springs, but there is a difficult problem involved in separating residential bases from temporary camps on the basis of field observation in that the observable criteria for each are the same (Thomas 1983:20). The difference lies in longer duration of occupation of the residential base with resultant greater artifact density and diversity. In the Groom Range, large zones of artifacts were observed surrounding springs. However, most of these artifact zones were beyond the scope of our 500 meter square sample units. Thus only portions of the artifact concentrations around springs were mapped and recorded. These smaller sites most likely represent campsites at only portions of residential bases, and a wide range of foraging activities that occurred around these base camps. Since definition of residential bases is beyond the scope of direct field observation at this point, the site type was not used for any single site in the Groom Range.

Temporary Camps

Thirty (11.8%) archaeological sites in the Groom Range were classified as temporary camps. Most of these sites are characterized by a high diversity of activities with minimum of two activities occurring at each site (Table 5-2). Toolstone diversity also is high, with an average of 5.07 types per site. Most sites (86.7 percent) contain remains of food preparation. Thirty percent of the sites contain the remains of caches representing the storage of foodstuffs during occupancy. Fifteen habitation features in the project area occurred at 23.3 percent of these temporary camps. Debitage was present at 90 percent of the temporary camps, but density of this debitage was highly variable, ranging from <.01 to 35 artifacts per square meter. Two of the five personal adornment artifacts from the Groom Range also occur at these temporary camps. Biface production, specific tasks, and hunting is also well represented.

Table 5-2: Selected attributes of Temporary Camps at the Groom Range.

Site Number	Food Prep	Spec Task	Bi-face	Adorn-ment	Hunt-ing	Habit-ation	Cache	Debitage Density (sq. m)	Tool-stone
26Ln3076	1	-	-	-	3	-	-	23.00	6
26Ln3078	44	4	15	-	1	-	-	0.64	9
26Ln3080	7	1	5	-	-	-	-	3.70	4
26Ln3084	50	-	1	1	2	-	1	5.18	8
26Ln3088	4	-	-	-	-	-	1	----	1
26Ln3093	3	-	-	-	-	1	-	0.05	3
26Ln3094	5	5	1	1	11	-	2	11.89	9
26Ln3095	1	-	-	-	-	1	-	0.03	3
26Ln3096	1	-	1	-	-	-	1	0.25	1
26Ln3097	9	1	2	-	-	9	-	1.33	9

Table 5-2: Selected attributes of Temporary Camps at the Groom Range. (cont'd)

Site Number	Food Prep	Spec Task	Bi-face	Adorn-ment	Hunt-ing	Habit-ation	Cache	Debitage Density (sq. m)	Tool-stone
26Ln3105	5	1	2	-	-	-	-	0.67	5
26Ln3117	4	1	3	-	1	-	-	2.67	5
26Ln3120	3	-	2	-	-	-	-	0.89	4
26Ln3121	3	-	1	-	-	1	17	0.18	3
26Ln3123	1	2	-	-	3	-	-	0.15	6
26Ln3124	5	3	2	-	2	-	-	5.23	9
26Ln3126	26	-	-	-	1	-	-	2.00	2
26Ln3129	3	-	-	-	1	-	-	----	1
26Ln3133	6	2	1	-	5	-	-	2.40	8
26Ln3134	-	1	1	-	1	-	-	3.00	4
26Ln3135	3	1	10	-	1	-	1	0.52	6
26Ln3143	-	1	-	-	1	1	-	0.22	4
26Ln3144	8	2	6	-	-	-	-	35.50	7
26Ln3186	-	-	-	-	-	-	-	19.00	3
26Ln3262	8	-	-	-	-	1	-	<0.01	10
26Ln3297	5	-	1	-	-	1	-	----	4
26Ln3308	5	1	1	-	1	-	1	0.79	6
26Ln3309	1	1	2	-	-	-	-	0.16	4
26Ln3314	-	2	4	-	1	-	1	0.72	5
26Ln3323	1	-	7	-	-	-	1	1.31	3

Milling Stations

Only two sites (26Ln3166 and 3237) were characterized by the presence of isolated milling stones. Nearly all (97.0 percent) of the 67 milling stones found in the project area were in association with larger sites, mostly temporary camps, indicating that milling activity was one of several tasks performed at a given location.

Quarries

A basic resource for aboriginal folk in the Great Basin was lithic material for production of flaked stone tools. Acceptable materials include a wide variety of rock types but all have the attribute of displaying concoidal fractures when sharply struck by another hard object. Very glassy materials such as obsidian easily provide very sharp cutting edges and are preferred for most applications, but more durable materials with a very fine crystalline structure such as basalt or quartzite are better suited for tools such as knives or drills that need to withstand extensive abrasion or force. Potential sources of toolstone are rare in most of the Groom Range. Most of the volcanic areas lack the necessary glassy rock, the quartzite is normally not fine enough grained to be usable, and the cherts in limestone areas are generally full of cleavage planes that make the material unworkable. However, a few sites where local toolstone has been exploited by prehistoric peoples (Figure 5-2).

Brooks, Ellis, and Wilson (1978) have reported the occurrence of a brown and black mottled chert of toolstone quality on the slopes near site 26Ln663, on the northwest side of the Jumbled Hills. Bedrock on these slopes is Lower Mississippian Limestone (Tschanz and Pampeyan 1970). Cherts and dolomitic sandstone occurs in alluvium throughout the upper bajadas below the portions of the southern end of the Groom Range formed by the Highland Peak Formation (Tschanz and Pampeyan 1970). Evidence for the opportunistic quarrying of this toolstone is common on these bajadas. Here, in order to locate usable toolstone, aboriginal stone workers apparently broke a number of white cortex covered nodules to find the few that contained usable brown to orange chert. Due to the diffuse distribution of such nodules, it is unlikely that people made specific trips to this area to find toolstone, but rather exploited it as a secondary activity while engaged in other pursuits (Gould 1980). Several sites (26Ln3211, 3213, 3214, 3216, 3217, and 3261) were recorded that represented the reduction of useful cobbles. All these sites contained cores and with the exception of 26Ln3214 and 26Ln3261, all are small (25 m^2 or less). Site 26Ln3214 was extremely diffuse, with only 6 artifacts found in a 400 m^2 area. Site 26Ln3261, covering 30x120 m was apparently the locus of more than simple opportunistic quarrying activity, because of its strategic location at the tip of a southernmost ridge and the occurrence of bifacial stage forms. Debitage at all of these sites is limited in quantity, with a maximum of 15 flakes at any one site. With the exception of biface thinning flakes at 26Ln3261, the debitage at these opportunistic quarries is marked by the earliest stages of cobble reduction (decortication flakes, core reduction flakes, and shatter).

The only bedrock quarry found in a the Highland Formation occurs uphill from the alluvial sites. This site, the Highland Quarry (26Ln3190), is situated around an exposure of orange to brown chert. All exposed cobbles of this chert had been knapped and toolstone at this quarry may have been depleted. There is no evidence of quarry pits. Artifacts observed at this site include three cores, 18 percent decortication flakes, 68 percent core reduction flakes, 10 percent shatter and 4 percent indeterminate flakes, but artifact density at the site is quite low (3.67 flakes/m^2). Additional cobbles and debitage found in the drainage bottoms beside and below the outcrop, although recorded as a separate site (26Ln3189), probably also reflect quarrying activities at the Highland Quarry.

A minor toolstone source was located along the wash system east of Groom Lake. Here, opalized chert toolstone washed from the hills to the east had been quarried at two sites: 26Ln3220 and 3250. Like other opportunistic quarries in the Groom Range, these sites were characterized by a high frequency of decortication and core reduction flakes.

The Pogonip Quarry (26Ln3198) is located on the side of a low ridge of thin-bedded limestone of the Pogonip Group along the southern margin of the Groom Range (Figure 5-3). Although covering only about 25 ares, the blue-white chert debitage at this quarry reaches a density of 832 flakes/m^2. A 0.25 sq. m sample unit yielded 36 percent decortication flakes, 48 percent

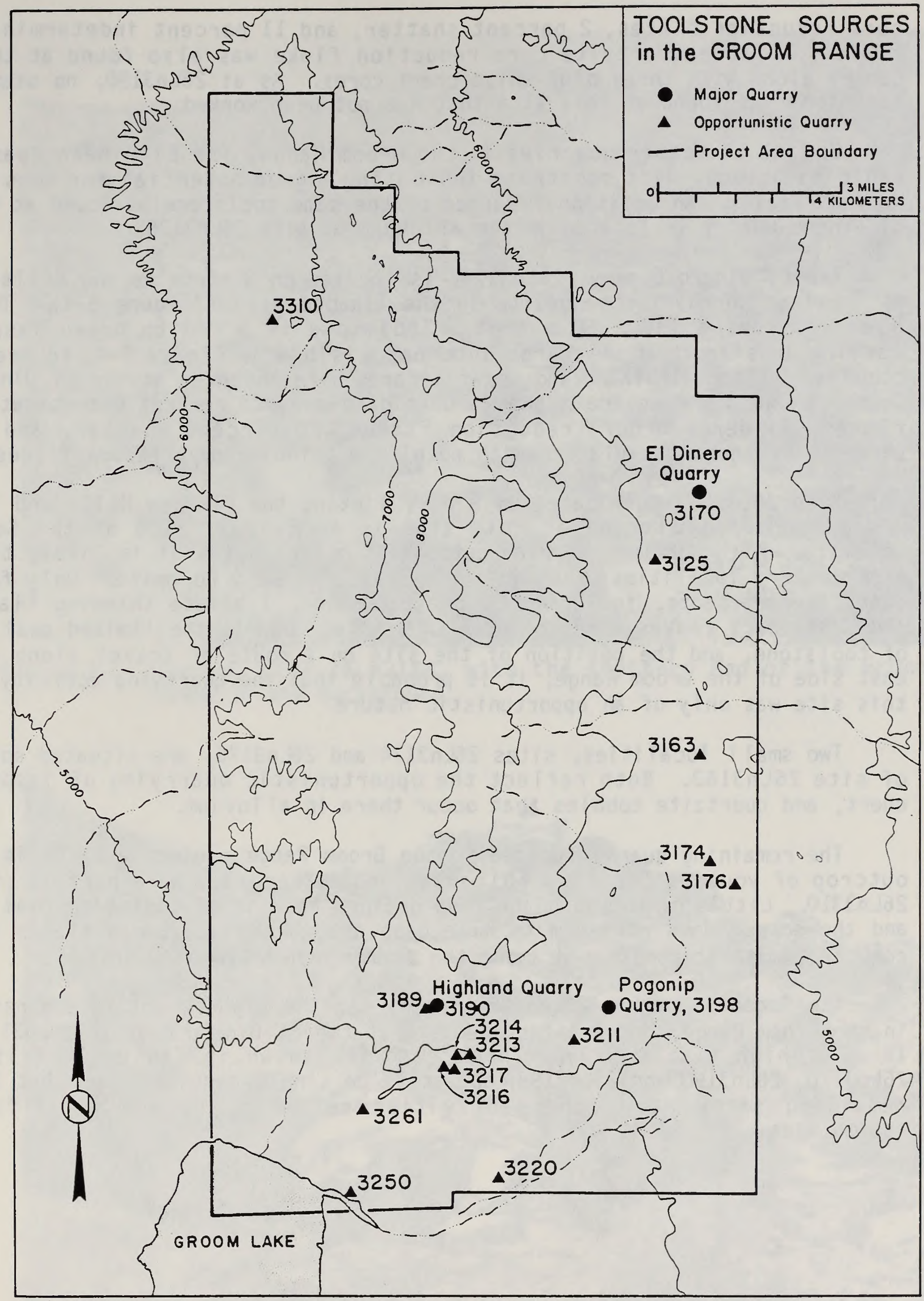

Figure 5-2: Toolstone sources in the Groom Range, Lincoln County, Nevada.

core reduction flakes, 2 percent shatter, and 11 percent indeterminate flakes. A lone quartzite core reduction flake was also found at this Quarry along with three blue-white chert cores. As at 26Ln3190, no usable toolstone was found at this site that had not been worked.

Unlike the other quarries in the Groom Range, The El Dinero Quarry exhibits a loose dirt substrate indicating a good potential for housing buried remains. An additional source of the same toolstone as found at the El Dinero Quarry is located in the alluvium at site 26Ln3125.

The El Dinero Quarry, 26Ln3170, is located on a north facing hillside of Tertiary porphyritic andesite in the Tikaboo Hills (Figure 5-4). This quarry covers a 150 x 60 m area. Toolstone is a red to brown jasper varying in size from the large outcrops visible in Figure 5-4, to small cobbles. A Stage I biface and several cores were observed at the El Dinero Quarry and the one square m sample unit displayed 25 percent decortication flakes, 35 percent core reduction flakes, 20 percent shatter, and 20 percent indeterminate flakes, with no biface thinning or pressure flakes.

Site 26Ln3163 is located on a pass linking the Tikaboo Hills and the Groom Range. Toolstone at this site is sandy quartzite of the Sevy Dolomite. Although the quarried outcrop is quite small, it is likely that other quarry localities occur in the exposure of Sevy Dolomite. Only four quartzite artifacts, including 3 core reduction, 1 biface thinning flake, and four chert flakes were found on this site. Due to the limited quality of toolstone, and the position of the site on a route of travel along the east side of the Groom Range, it is probable that the quarrying activity at this site was only of an opportunistic nature.

Two small localities, sites 26Ln3174 and 26Ln3176, are situated south of site 26Ln3163. Both reflect the opportunistic quarrying of jasper, chert, and quartzite cobbles that occur there in alluvium.

The remaining quarry located in the Groom Range project area is in an outcrop of younger Tertiary volcanics and is recorded as a part of site 26Ln3310. Little of the abundant fine-grained rock is of toolstone quality and the source does not seem to have been used heavily. Large flakes and core fragments are scattered among the common non-cultural debris.

The Pogonip Quarry (26Ln3198) has by far the highest artifact density in the Groom Range, but artifact density at the El Dinero quarry (26Ln3170) is also high (Table 5-3). Three quarries shown in Table 5-3 (sites 26Ln3170, 26Ln3190 and 26Ln3198) appear to be single purpose sites, but the remaining sites have other activities reflected by their artifact assemblages.

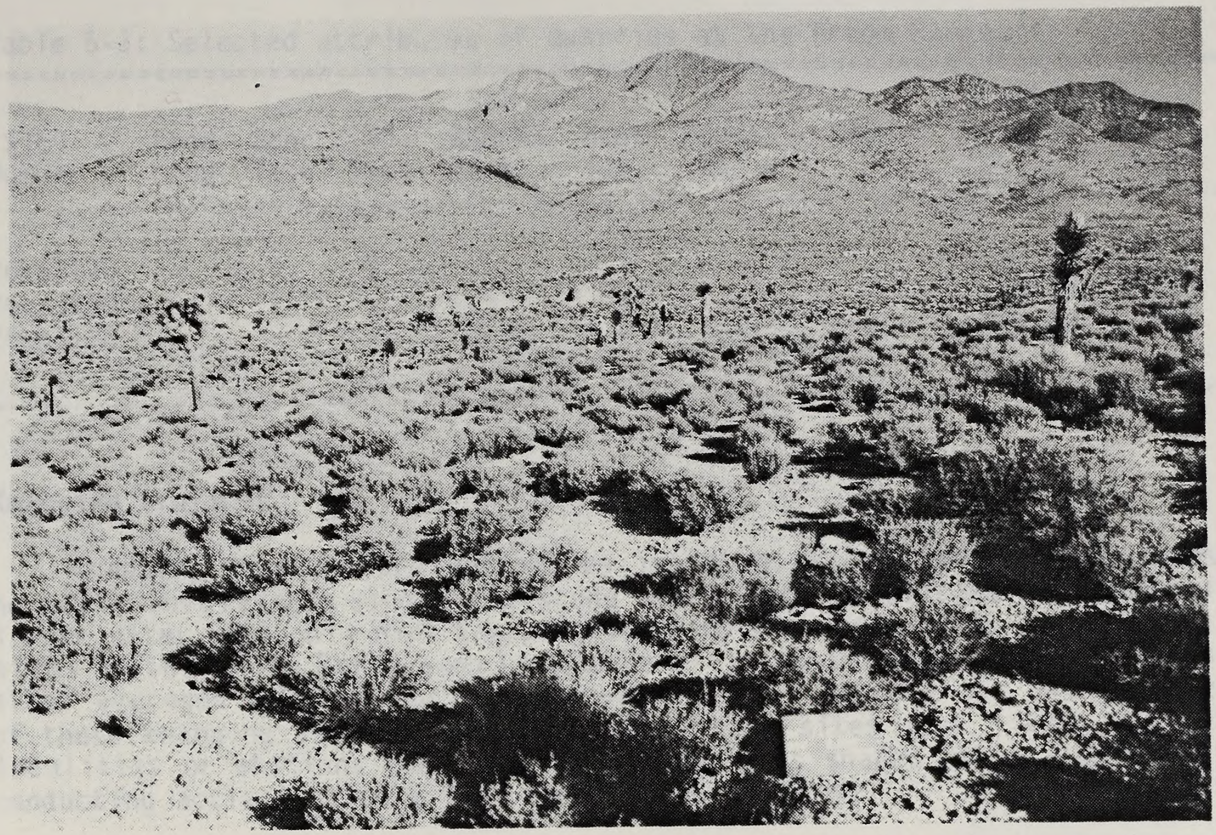

Figure 5-3: Quarry, site 26Ln3198, with the southern end of the Groom Range in the background.

Figure 5-4: El Dinero Quarry, site 26Ln3170.

Table 5-3: Selected attributes of quarries at the Groom Range.

Site Number	Food Prep	Spec Task	Bi-face	Adorn-ment	Hunt-ing	Habit-ation	Cache	Debitage Density (sq. m.)	Tool-stone
26Ln3170	-	-	1	-	-	-	-	20.00	5
26Ln3190	-	-	-	-	-	-	-	3.67	1
26Ln3198	-	-	-	-	-	-	-	104.00	2

Knapping Stations

Knapping stations are defined by isolated, single knapping episodes, normally involving a single toolstone type. Such localities are common in larger sites, but only nine knapping stations were identified as individual sites in the Groom Range sample (Table 5-4). Artifact density at these sites averages 2.18 artifacts per square meter. Whereas the average size of these knapping stations was .27 ares. These sites most likely reflect localities or stations where prehistoric peoples shaped stone tools while conducting activities away from their temporary camp.

Table 5-4: Selected attributes of knapping stations at the Groom Range.

Site Number	Food Prep	Spec Task	Bi-face	Adorn-ment	Hunt-ing	Habit-ation	Cache	Debitage Density (sq. m.)	Tool-stone
26Ln3130	-	-	-	-	-	-	-	4.00	1
26Ln3183	-	-	-	-	-	-	-	0.40	2
26Ln3193	-	-	-	-	-	-	-	0.40	2
26Ln3197	-	-	-	-	-	-	-	0.91	1
26Ln3211	-	-	-	-	-	-	-	0.32	1
26Ln3216	-	-	-	-	-	-	-	2.00	1
26Ln3229	-	-	-	-	-	-	-	5.17	1
26Ln3235	-	-	-	-	-	-	-	1.78	1
26Ln3328	-	-	-	-	-	-	-	4.67	1

Most commonly, sites identified as knapping stations exhibit a preponderance of debitage types indicative of the earlier stages of stone tool manufacture but with a general lack of decortication flakes (Figure 5-5). This indicates that the early step in tool making is often undertaken at a discrete locality whereas finishing is often done at a multi-task site where the resultant debitage is likely to become intermixed with a variety of other toolstones. Several knapping stations diverge in varying degrees from this general pattern. Site 26Ln3328 has no decortication flakes and

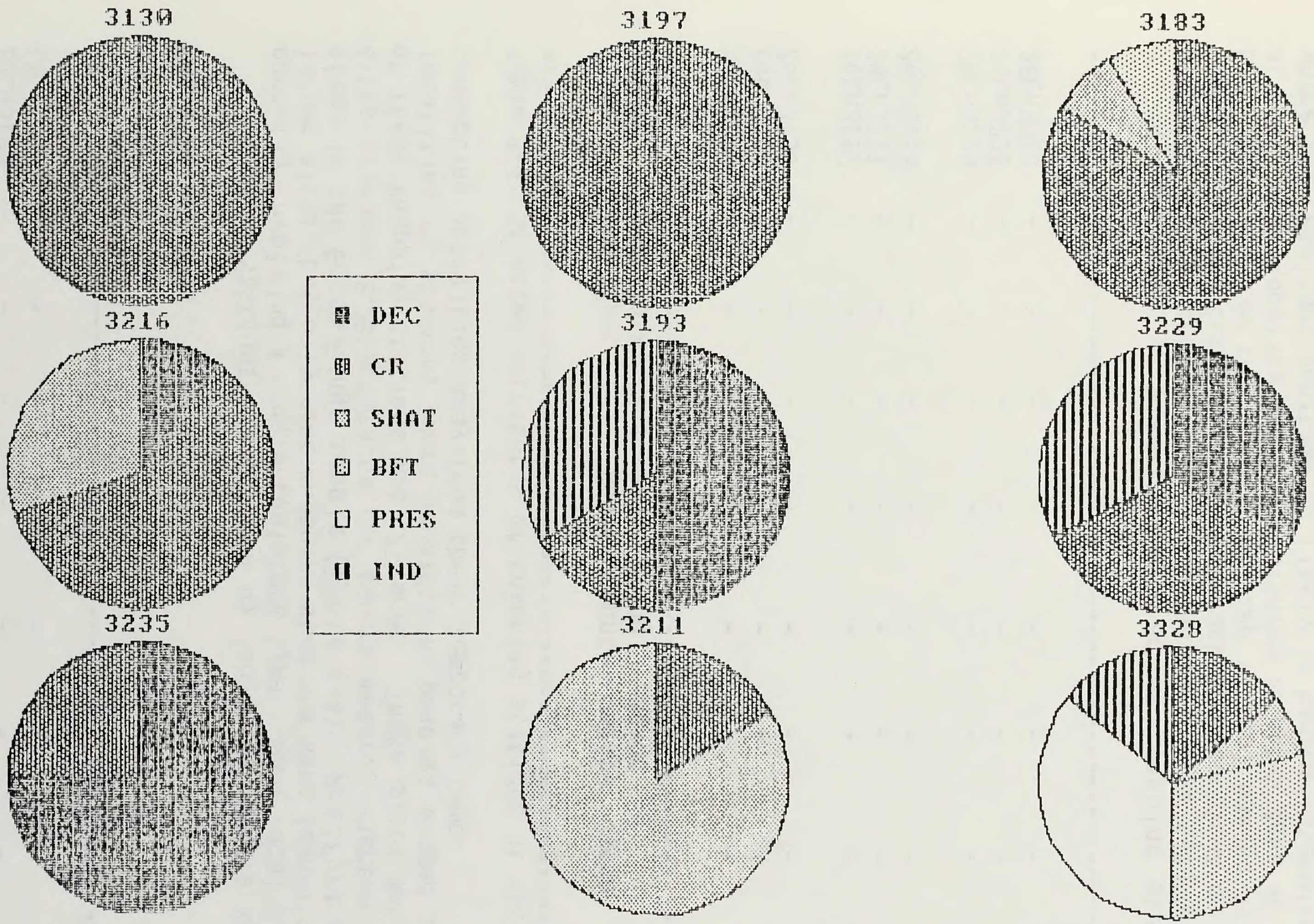

Figure 5-5: Debitage types present in knapping stations in the Groom Range, Lincoln County, Nevada.

DEC = Decortication
CR = Core Reduction
SHAT = Shatter
BFT = Biface Thinning
PRES = Pressure
IND = Indeterminate

approximately equal percentages of all other debitage types. Site 26Ln3235 exhibits preponderance (75 percent) of decortication flakes with the remainder being core reduction. Sites 26Ln3193 and 26Ln3229 are a mix of decortication, core reduction, and indeterminate. Site 26Ln3211 is composed almost entirely of shatter.

Lithic Scatters

Fifty-two lithic scatters (20.4 percent of all sites) were recorded in the Groom Range sample. All are characterized by debitage usually from a number of different toolstones with an average density of 1.98 artifacts per square meter (Table 5-5). They lack evidence of habitation, but two caches occur at one site and three other lithic scatters have evidence of food preparation. Special task activities occurred at nearly a fourth (21.2 percent) of the sites and the same percentage contained projectile points. Toolstone diversity averages 3.52. Aside from debitage, the most common artifacts at these sites were bifaces, which were observed at 46.1 percent of all the lithic scatters in the Groom Range. However, the diversity of tasks represented within this site type is quite low with an average of 2 tasks per site.

Table 5-5: Selected attributes of lithic scatters at the Groom Range.

Site Number	Food Prep	Spec Task	Bi-face	Adorn-ment	Hunt-ing	Habit-ation	Cache	Debitage Density (sq. m.)	Tool-stone
26Ln3077	-	-	-	-	-	-	-	*	1
26Ln3086	-	-	-	-	1	-	-	2.80	6
26Ln3092	-	1	3	-	-	-	-	*	5
26Ln3106	-	-	1	-	2	-	-	0.04	5
26Ln3107	-	-	-	-	2	-	-	1.12	5
26Ln3111	-	1	6	-	-	-	-	0.83	5
26Ln3125	-	-	-	-	2	-	-	1.00	6
26Ln3127	-	-	-	-	1	-	-	6.00	5
26Ln3137	1	1	2	-	2	-	-	1.33	5
26Ln3145	-	-	3	-	-	-	2	0.32	5
26Ln3159	-	-	1	-	2	-	-	2.78	5
26Ln3163	-	-	-	-	-	-	-	1.60	2
26Ln3168	-	-	3	-	-	-	-	15.00	4
26Ln3173	-	-	2	-	-	-	-	0.73	3
26Ln3176	-	-	-	-	-	-	-	0.14	4
26Ln3187	-	-	-	-	-	-	-	1.11	1
26Ln3194	-	-	-	-	-	-	-	1.60	3
26Ln3199	-	-	-	-	-	-	-	0.07	6
26Ln3200	-	-	-	-	-	-	-	0.22	2
26Ln3201	-	-	-	-	-	-	-	0.05	1

* Debitage present but not quantified.

Table 5-5: Selected attributes of lithic scatters at the Groom Range. (cont'd)

Site Number	Food Prep	Spec Task	Bi-face	Adorn-ment	Hunt-ing	Habit-ation	Cache	Debitage Density (sq. m.)	Tool-stone
26Ln3204	-	1	2	-	-	-	-	0.47	4
26Ln3206	-	-	1	-	-	-	-	0.32	4
26Ln3208	-	-	-	-	-	-	-	0.53	3
26Ln3209	-	-	-	-	-	-	-	0.09	5
26Ln3214	-	-	-	-	-	-	-	6.00	1
26Ln3215	-	-	-	-	-	-	-	2.20	2
26Ln3217	-	-	-	-	-	-	-	2.50	3
26Ln3219	-	1	-	-	-	-	-	18.00	3
26Ln3220	-	2	-	-	-	-	-	0.44	2
26Ln3222	-	-	1	-	-	-	-	0.07	2
26Ln3223	-	-	1	-	-	-	-	0.32	2
26Ln3224	-	-	1	-	1	-	-	1.16	4
26Ln3225	-	-	-	-	-	-	-	0.56	2
26Ln3241	-	-	-	-	-	-	-	1.40	3
26Ln3248	-	2	-	-	1	-	-	4.40	5
26Ln3251	-	-	1	-	-	-	-	0.52	2
26Ln3252	2	2	1	-	-	-	-	0.06	5
26Ln3255	-	-	2	-	-	-	-	0.13	5
26Ln3261	-	-	-	-	-	-	-	2.25	2
26Ln3276	-	-	1	-	-	-	-	1.56	3
26Ln3279	-	-	2	-	-	-	-	0.07	4
26Ln3280	-	-	1	-	-	-	-	0.01	3
26Ln3290	-	-	-	-	-	-	-	0.01	2
26Ln3291	-	-	-	-	-	-	-	0.67	3
26Ln3292	1	-	2	-	-	-	-	1.21	2
26Ln3295	-	1	8	-	-	-	-	0.28	5
26Ln3298	-	-	1	-	-	-	-	<0.01	6
26Ln3301	-	-	-	-	-	-	-	8.00	3
26Ln3302	-	-	-	-	1	-	-	1.69	2
26Ln3303	-	-	1	-	-	-	-	<0.01	4
26Ln3310	-	6	-	2	1	-	-	1.25	6
26Ln3326	-	1	3	-	-	-	-	6.00	4

Localities

The 53 archaeological sites classified as localities comprise 20.8 percent of all recorded sites (Table 5-6). Most (94.3 percent) of these localities contain debitage, but other tasks represented include special tasks (26.4 percent), biface production (22.6 percent), hunting (17.0 percent), caching (3.8 percent), and food preparation (9.4 percent). The number of artifacts present at individual sites is relatively small and toolstone diversity is low, averaging 2 toolstone types per site.

Table 5-6: Selected attributes of localities at the Groom Range.

Site Number	Food Prep	Spec Task	Bi-face	Adorn-ment	Hunt-ing	Habit-ation	Cache	Debitage Density (sq. m.)	Tool-stone
26Ln3079	-	-	-	-	-	-	4	0.02	2
26Ln3098	-	-	-	-	-	-	-	0.04	3
26Ln3100	1	-	-	-	-	-	-	0.01	2
26Ln3102	1	-	-	-	-	-	-	0.09	1
26Ln3103	-	-	1	-	-	-	-	----	2
26Ln3109	-	1	1	-	-	-	-	<0.01	1
26Ln3113	-	2	-	-	1	-	-	0.50	4
26Ln3118	1	-	1	-	1	-	-	0.14	4
26Ln3119	-	-	-	-	-	-	2	----	-
26Ln3122	1	-	1	-	-	-	-	0.00	1
26Ln3132	-	1	-	-	-	-	-	0.04	3
26Ln3141	-	1	-	-	-	-	-	0.21	4
26Ln3147	-	2	-	-	-	-	-	0.05	1
26Ln3150	-	-	1	-	-	-	-	1.00	2
26Ln3151	-	-	-	-	-	-	-	1.33	1
26Ln3156	-	3	-	-	2	-	-	0.02	3
26Ln3158	-	-	-	-	-	-	-	1.43	4
26Ln3165	-	-	-	-	-	-	-	1.00	2
26Ln3171	-	1	1	-	-	-	-	0.44	2
26Ln3174	-	-	-	-	-	-	-	<0.01	2
26Ln3179	-	-	-	-	-	-	-	2.00	1
26Ln3180	-	-	-	-	-	-	-	0.25	2
26Ln3185	-	-	-	-	-	-	-	0.02	2
26Ln3188	-	-	-	-	-	-	-	0.05	2
26Ln3189	-	-	-	-	-	-	-	5.00	2
26Ln3192	-	-	1	-	-	-	-	0.29	1
26Ln3195	-	-	-	-	-	-	-	1.50	2
26Ln3196	-	1	-	-	-	-	-	0.01	3
26Ln3205	-	-	-	-	1	-	-	0.18	3
26Ln3221	-	-	-	-	-	-	-	0.04	1

Table 5-6: Selected attributes of localities at the Groom Range (cont'd)

Site Number	Food Prep	Spec Task	Bi-face	Adorn-ment	Hunt-ing	Habit-ation	Cache	Debitage Density (sq. m.)	Tool-stone
26Ln3230	-	1	-	-	-	-	-	1.25	2
26Ln3231	-	-	-	-	-	-	-	1.00	1
26Ln3240	-	-	-	-	-	-	-	2.00	1
26Ln3249	-	-	1	-	-	-	-	0.06	2
26Ln3250	-	1	-	-	-	-	-	0.04	1
26Ln3253	-	-	-	-	-	-	-	0.40	3
26Ln3254	-	-	-	-	-	-	-	0.29	2
26Ln3263	-	-	-	-	-	-	-	0.18	2
26Ln3265	-	-	-	-	-	-	-	----	-
26Ln3266	-	-	1	-	-	-	-	0.12	4
26Ln3268	-	-	-	-	-	-	-	3.00	1
26Ln3273	1	-	-	-	-	-	-	0.02	1
26Ln3278	-	-	-	-	1	-	-	1.00	2
26Ln3285	-	1	1	-	1	-	-	0.02	3
26Ln3287	-	-	1	-	1	-	-	0.08	3
26Ln3293	-	-	-	-	-	-	-	2.00	1
26Ln3294	-	-	-	-	-	-	-	2.00	1
26Ln3300	-	1	-	-	-	-	-	0.04	2
26Ln3311	-	-	-	-	-	-	-	0.04	2
26Ln3324	-	-	-	-	-	-	-	0.75	3
26Ln3325	-	3	2	-	1	-	-	<0.01	3
26Ln3327	-	2	-	-	-	-	-	0.29	2
26Ln3329	-	-	-	-	1	-	-	0.06	3

Isolates

Isolates are the most common (31.4 percent) type of archaeological site in the Groom Range (Table 5-7). Over half (57.5 percent) of these isolates are debitage. Bifacial stage forms occur in 15.0 percent, special task artifact in 11.3 percent, hunting artifacts (projectile points) in 6.2 percent, and adornment in 1.3 percent of isolate sites.

Table 5-7: Selected attributes of Isolate sites at the Groom Range.

Site Number	Food Prep	Spec Task	Bi-face	Adorn-ment	Hunt-ing	Habit-ation	Cache	Debitage Density (sq. m.)	Tool-stone
26Ln3083	-	-	-	-	-	-	-	1.00	1
26Ln3085	-	-	-	-	-	-	-	1.00	1
26Ln3087	-	-	-	-	1	-	-	----	1
26Ln3089	-	-	-	-	-	-	-	1.00	1
26Ln3090	-	-	-	-	-	-	-	----	1
26Ln3099	-	1	-	-	-	-	-	----	1
26Ln3101	-	-	-	-	-	-	-	----	-
26Ln3108	-	-	1	-	-	-	-	----	1
26Ln3110	-	-	-	-	1	-	-	----	1
26Ln3112	-	-	-	-	-	-	-	1.00	1
26Ln3131	-	-	-	-	-	-	-	1.00	1
26Ln3136	-	-	1	-	-	-	-	----	1
26Ln3138	-	1	-	-	-	-	-	----	1
26Ln3139	-	1	-	-	-	-	-	----	1
26Ln3140	-	-	-	-	-	-	-	1.00	1
26Ln3146	-	1	-	-	-	-	-	----	1
26Ln3148	-	-	-	-	-	-	-	1.00	1
26Ln3149	-	1	-	-	-	-	-	----	1
26Ln3152	-	-	-	-	-	-	-	1.00	1
26Ln3153	-	-	-	-	-	-	-	1.00	1
26Ln3154	-	-	1	-	-	-	-	----	1
26Ln3155	-	-	-	-	-	-	-	1.00	1
26Ln3157	-	-	1	-	-	-	-	----	1
26Ln3160	-	-	1	-	-	-	-	----	1
26Ln3161	-	-	-	-	1	-	-	----	1
26Ln3162	-	-	-	-	-	-	-	1.00	1
26Ln3164	-	-	-	-	-	-	-	1.00	1
26Ln3167	-	-	1	-	-	-	-	----	1
26Ln3172	-	-	-	-	-	-	-	1.00	1
26Ln3175	-	-	-	-	-	-	-	1.00	1
26Ln3177	-	1	-	-	-	-	-	----	1
26Ln3178	-	-	-	-	-	-	-	----	1
26Ln3181	-	-	-	-	-	-	-	1.00	1
26Ln3182	-	-	-	-	-	-	-	----	-
26Ln3184	-	-	-	1	-	-	-	1.00	1
26Ln3191	-	-	-	-	-	-	-	1.00	1
26Ln3202	-	-	-	-	-	-	-	1.00	1
26Ln3203	-	-	-	-	-	-	-	1.00	1
26Ln3207	-	-	-	-	-	-	-	1.00	1
26Ln3210	-	-	1	-	-	-	-	----	1

Table 5-7: Selected attributes of Isolate sites at the Groom Range (cont.)

Site Number	Food Prep	Spec Task	Bi-face	Adorn-ment	Hunt-ing	Habit-ation	Cache	Debitage Density (sq. m.)	Tool-stone
26Ln3212	-	-	-	-	-	-	-	1.00	1
26Ln3213	-	-	-	-	-	-	-	----	1
26Ln3226	-	-	1	-	-	-	-	----	1
26Ln3227	-	-	-	-	-	-	-	1.00	1
26Ln3228	-	-	-	-	-	-	-	1.00	1
26Ln3232	-	-	-	-	-	-	-	1.00	1
26Ln3233	-	-	-	-	-	-	-	1.00	1
26Ln3234	-	1	-	-	-	-	-	----	1
26Ln3236	-	-	-	-	-	-	-	1.00	1
26Ln3238	-	-	-	-	-	-	-	1.00	1
26Ln3239	-	-	-	-	-	-	-	1.00	1
26Ln3242	-	-	-	-	-	-	-	1.00	1
26Ln3243	-	1	-	-	-	-	-	----	1
26Ln3244	-	-	-	-	-	-	-	1.00	1
26Ln3245	-	-	-	-	-	-	-	1.00	1
26Ln3246	-	-	-	-	-	-	-	1.00	1
26Ln3247	-	-	-	-	-	-	-	1.00	1
26Ln3256	-	-	-	-	1	-	-	----	1
26Ln3257	-	-	1	-	-	-	-	----	1
26Ln3258	-	-	-	-	-	-	-	1.00	1
26Ln3259	-	-	-	-	-	-	-	1.00	1
26Ln3269	-	-	-	-	-	-	-	1.00	1
26Ln3270	-	-	-	-	-	-	-	----	-
26Ln3272	-	-	-	-	-	-	-	----	-
26Ln3274	-	-	-	-	-	-	-	1.00	1
26Ln3275	-	-	1	-	-	-	-	----	1
26Ln3281	-	-	-	-	-	-	-	1.00	1
26Ln3284	-	-	-	-	-	-	-	1.00	1
26Ln3288	-	-	-	-	-	-	-	1.00	1
26Ln3289	-	-	1	-	-	-	-	----	1
26Ln3299	-	-	-	-	1	-	-	----	1
26Ln3304	-	-	-	-	-	-	-	----	1
26Ln3305	-	-	1	-	-	-	-	----	1
26Ln3306	-	-	-	-	-	-	-	1.00	1
26Ln3315	-	1	-	-	-	-	-	----	1
26Ln3316	-	-	-	-	-	-	-	1.00	1
26Ln3317	-	-	-	-	-	-	-	1.00	1
26Ln3318	-	-	-	-	-	-	-	1.00	1
26Ln3319	-	-	-	-	-	-	-	1.00	1
26Ln3320	-	-	-	-	-	-	-	1.00	1

Prehistoric Rock Features

Few anthropologists would consider architecture an important characteristic of Great Basin hunters and gatherers' life style. After all, these peoples were highly nomadic and their habitation sites were generally occupied for relatively short periods of time. Hence, their house forms and other architectural features were marked by a basic simplicity oriented around immediate functional need rather than artistic or symbolic expression (Steward 1940:485; 1941:355). Great Basin ethnographers report several house forms in use during the late 19th and early 20th centuries. These include caves, rockshelters, conical and semicircular wooden lodges, gabled wooden lodges, dome-shaped willow and tule wickiups, unwalled arbors or ramadas, skin covered tipis, circular unroofed brush enclosures or "corrals", various other kinds of windbreaks, both conical and dome-shaped suditories, and Euroamerican-like rectangular cabins (Colville 1892; Dellenbough 1926:177-178; Dutcher 1893:377-378; Fowler and Fowler 1971; Kelly 1932:104-106; 1964:55-57; Lowie 1909:182-184; 1924:218-220; Nelson 1891:372; Powell 1875:126; Simpson 1876; Spier 1928:180-181; Steward 1933:263-266; 1938:54-55; 1941:233-236; Stewart 1941:377-379; 1942:256-259). Aside from natural rockshelters and caves, these sorts of temporary structures are rarely preserved in the archaeological record (Pippin 1984b; 1986b:90-103). Alignments and other assemblages of rocks and other nonperishable building materials often provide the only evidence that a structure may have existed at any particular locality. The importance of architectural features in the Groom Range archaeological record, therefore, lies not with their aesthetic or design qualities, but rather with their potential to reveal functional and social aspects of hunter and gatherer life styles.

The recognition and interpretation of these sorts of rock features, however, is complicated by the fact that rocks may have been used by ancient Great Basin hunters and gatherers in a diversity of ways for a variety of reasons (Dansie 1982). Hence, not all rock features in the archaeological record may reflect habitation structures. Hoffman (1878:473-474) observed several kinds of stone circles in the southern Great Basin that had resulted from both the caching of pinyon nuts and from the construction of "lookout" stations used by hunting parties. Colville (1892:353) likewise describes rock circle features made by the Panamint Indians around both temporary habitation windbreaks and pinyon nut caches. Similarly, Muir (1894:320-322) recorded many "nest-like" stone enclosures on Great Basin mountain ranges that were used during the hunting of mountain sheep. Lowie (1924:279) records the use of rock cairns among the Moapa Southern Paiute to cover burials and this use is likewise indicated for other areas in the Great Basin (Steward 1941:319; Stewart 1942:312). During her reconnaissance of the Mono Lake Basin, Davis (1965:10) notes "today, large 'house rings' of rock, deer hunting blinds between boulders, windbreak walls outside of rock shelters and stone circles for pine nut storage are the only structures still visible..."

Forty-eight rock features occur at the prehistoric archaeological sites recorded in the Groom Range project area (Tables 5-8, 5-9, and 5-10). All but two of the 23 sites containing these features occur in pinyon and, although ranging in elevation from 4800 to 8000 ft, most (85 percent) sites fall between 7000 and 8000 ft (Table 5-9). Eight-five percent of these sites occur on relatively flat ground (5 degrees or less slope) and most

Table 5-8: Selected attributes of rock ring and other rock alignment features in the Groom Range, Lincoln County, Nevada.

Site Number	Feature Number	Outside Diameter Maximum	Outside Diameter Minimum	Inside Diameter Maximum	Inside Diameter Minimum	Total Rocks	On Bedrock	Fill (cm)	Burned (FCR)	Charcoal	Artifacts
26Ln3081	1	4.50	4.50	1.50	1.50	155	No	5-10	No	No	Yes
26Ln3084	1	5.00	4.00	-	-	100	No	5-10	No	No	Yes
26Ln3094	3	3.00	2.00	0.50	1.00	62	No	1-5	No	No	Yes
26Ln3096	1	4.70	3.20	2.40	1.80	78	No	1-5	Yes	No	Yes
26Ln3097	1-1	3.80	-	-	-	10	No	1-5	No	No	Yes
26Ln3097	1-3	1.00	-	-	-	6	No	1-5	Yes	No	Yes
26Ln3097	2-1	0.90	0.60	0.20	0.20	15	Yes	1-5	No	No	No
26Ln3104	1	3.50	2.90	2.80	2.10	56	No	5-10	No	No	No
26Ln3114	1	5.30	4.50	4.00	3.00	-	No	1-5	No	No	No
26Ln3115	1	3.60	2.40	2.40	.60	-	No	1-5	No	No	No
26Ln3116	1	3.40	3.90	2.40	2.00	117	No	1-5	No	No	No
26Ln3119	1	0.70	0.60	0.00	0.00	41	No	1-5	No	No	No
26Ln3119	2	3.10	2.70	1.50	1.40	23	No	1-5	No	No	No
26Ln3121	1	2.10	2.00	0.30	0.30	15	No	1-5	No	No	Yes
26Ln3121	2	3.40	3.20	0.90	0.80	91	No	10-20	No	No	Yes
26Ln3121	3	3.00	3.00	1.40	1.20	31	No	5-10	No	No	Yes
26Ln3121	4	3.60	3.60	2.30	2.20	65	No	5-10	No	No	Yes
26Ln3121	5	3.00	2.80	1.60	1.30	34	No	5-10	No	No	Yes
26Ln3121	6	4.00	3.40	2.50	1.80	73	No	5-10	No	No	Yes
26Ln3121	7	2.80	3.30	1.80	2.40	40	No	1-5	No	No	Yes
26Ln3121	8	5.20	5.00	2.30	2.10	137	No	10-20	No	No	No
26Ln3121	9	4.30	3.80	2.00	1.30	119	No	10-20	No	No	Yes
26Ln3121	10	3.50	2.30	2.00	1.50	41	No	5-10	No	No	No
26Ln3121	11	4.20	3.70	1.80	1.50	62	No	5-10	No	No	No
26Ln3121	12	3.00	2.40	1.50	1.30	58	No	1-5	No	No	No
26Ln3121	13	2.50	2.40	1.20	1.20	39	No	1-5	No	No	No
26Ln3121	14	2.80	2.80	1.40	1.40	65	No	1-5	No	No	No
26Ln3121	15	1.10	0.90	0.60	0.60	32	No	1-5	No	No	No
26Ln3121	16	3.50	3.00	1.20	1.20	41	No	1-5	No	No	No
26Ln3121	18	1.90	1.70	1.40	0.60	26	No	1-5	No	No	No
26Ln3135	1	1.50	1.00	0.00	0.00	19	Yes	1-5	No	No	No
26Ln3135	2	3.00	2.00	0.00	0.00	38	Yes	1-5	No	No	No
26Ln3135	3	1.60	1.60	0.00	0.00	20	Yes	1-5	No	No	No
26Ln3143	1	4.80	-	-	-	7	No	20-80	Yes	Yes	Yes
26Ln3145	1	2.40	2.40	2.00	2.00	19	No	1-5	No	No	Yes
26Ln3145	2	2.00	2.00	1.60	1.60	16	No	1-5	No	No	Yes
26Ln3264	1	1.30	1.10	0.20	0.20	18	Yes	1-5	No	No	No
26Ln3265	1	4.30	1.85	0.70	0.50	14	Yes	10-20	No	No	No
26Ln3312	1	4.00	3.70	1.90	1.80	5	No	1-5	No	No	No
26Ln3312	2	3.30	2.90	0.70	0.70	12	No	1-5	No	No	No
26Ln3313	1	3.20	2.90	2.00	1.40	86	No	1-5	No	No	Yes
26Ln3314	1	4.80	2.70	2.10	1.70	81	No	1-5	No	No	No
26Ln3321	1	4.80	4.00	3.30	2.20	91	No	1-5	No	No	Yes
26Ln3322	1	3.10	3.10	1.00	1.00	81	No	1-5	No	No	Yes
26Ln3322	2	5.00	3.80	1.50	1.30	111	No	1-5	Yes	Yes	Yes
26Ln3322	3	4.50	4.40	1.30	1.00	158	No	1-5	No	No	No
26Ln3323	1	3.80	3.60	1.50	1.60	42	No	1-5	No	No	Yes
26Ln3331	1	3.80	3.90	2.90	2.30	97	No	10-20	No	No	Yes

Table 5-9: Environmental characteristics of archaeological sites housing rock ring features in the Groom Range, Lincoln County, Nevada.

Site Number	Site Type	Elevation (feet)	Dominant Vegetation	Substrate	Slope (degrees)	Aspect (degrees)	Topographic Setting
26Ln3081	CA	6900	Pinyon-Juniper	Alluvium	4	40	Interfluve in valley bottom
26Ln3084	TC	5800	Juniper-Pinyon	Alluvium	3	90	Fan in valley bottom
26Ln3094	TC	6575	Pinyon-Juniper	Bedrock	0	60	Interfluve on foothill
26Ln3096	TC	7350	Pinyon-Juniper	Residual	2	40	Saddle on ridge top
26Ln3097-2	CA	6800	Pinyon-Juniper	Bedrock	22	360	Rockshelter on colluvial slope
26Ln3104	CA	7300	Pinyon	Residual	15	95	Slope of ridge top
26Ln3114	CA	7650	Pinyon-Fir	Alluvium	5	110	Interfluve at valley head
26Ln3115	CA	7850	Pinyon-Fir	Alluvium	5	110	Interfluve at valley head
26Ln3116	CA	7675	Pinyon-Fir	Alluvium	5	110	Interfluve at valley head
26Ln3119	LO	7300	Pinyon	Alluvium	10	100	Crag on ridge toe
26Ln3121	TC	7500	Pinyon	Alluvium	5	110	Knob on valley bottom
26Ln3135	TC	7200	Pinyon-Juniper	Bedrock	0	230	Slope of valley edge
26Ln3143	TC	6650	Pinyon-Juniper	Colluvium	23	130	Rockshelter at base of cliff
26Ln3145	LS	6350	Juniper-Pinyon.	Alluvium	0	90	Interior of alluvial fan
26Ln3264	CA	4880	Yucca	Bedrock	45	280	Rockshelter on ridge side
26Ln3312	CA	7480	Pinyon-Juniper	Colluvium	13	190	Floodplain on valley bottom
26Ln3313	CA	7600	Pinyon-Juniper	Alluvium	5	310	Terrace edge in valley bottom
26Ln3314	TC	7860	Pinyon-Juniper	Colluvium	0	215	Saddle on ridge top
26Ln3321	CA	7920	Pinyon-Juniper	Colluvium	10	56	Bench on peak face
26Ln3322	CA	7790	Pinyon-Juniper	Residual	4	310	Saddle on ridge top
26Ln3323	TC	7600	Pinyon-Juniper	Residual	5	40	Saddle on ridge top
26Ln3331	TC	7800	Pinyon	Colluvium	11	290	Interfluve on mountain side

Table 5-10: Rock size counts for rock features in the Groom Range, Lincoln County, Nevada.

Site Number	Feature Number	Rock Size Classes 10-20	20-30	30-40	40-50	50-60	60	Total Rocks
26Ln3081	1	100	45	10	0	0	0	155
26Ln3084	1	7	41	18	12	15	7	100
26Ln3094	3	23	25	3	6	4	1	62
26Ln3096	1	35	15	18	5	5	0	78
26Ln3097	2-1	8	4	3	0	0	0	15
26Ln3104	1	26	17	13	0	0	0	56
26Ln3114	1	-	-	-	-	-	-	-
26Ln3115	1	-	-	-	-	-	-	-
26Ln3116	1	40	40	28	7	2	0	117
26Ln3119	1	33	7	0	1	0	0	41
26Ln3119	2	5	8	3	7	0	0	23
26Ln3121	1	15	0	0	0	0	0	15
26Ln3121	2	40	20	13	15	2	1	91
26Ln3121	3	20	8	3	0	0	0	31
26Ln3121	4	3	15	44	2	0	1	65
26Ln3121	5	30	4	0	0	0	0	34
26Ln3121	6	14	49	10	0	0	0	73
26Ln3121	7	7	22	3	8	0	0	40
26Ln3121	8	50	47	12	17	10	1	137
26Ln3121	9	23	37	43	8	4	4	119
26Ln3121	10	7	14	15	4	0	1	41
26Ln3121	11	11	43	7	1	0	0	62
26Ln3121	12	29	19	10	0	0	0	58
26Ln3121	13	20	17	1	1	0	0	39
26Ln3121	14	24	30	9	2	0	0	65
26Ln3121	15	22	6	3	0	1	0	32
26Ln3121	16	13	20	4	4	0	0	41
26Ln3121	18	3	14	8	1	0	0	26
26Ln3135	0	-	-	-	-	-	-	-
26Ln3143	1	0	1	0	0	6	0	7
26Ln3145	1	6	9	4	0	0	0	19
26Ln3145	2	11	4	1	0	0	0	16
26Ln3265	1	9	3	1	0	1	0	14
26Ln3312	1	5	0	0	0	0	0	5
26Ln3312	2	0	12	0	0	0	0	12
26Ln3313	1	63	16	5	2	0	0	86
26Ln3314	1	45	8	15	10	2	1	81
26Ln3321	1	25	35	20	9	2	0	91
26Ln3322	1	43	35	3	0	0	0	81
26Ln3322	2	54	18	19	11	8	1	111

Table 5-10: Rock size counts for rock features in the Groom Range, Lincoln County, Nevada. (cont'd)

Site Number	Feature Number	Rock Size Classes 10-20	20-30	30-40	40-50	50-60	60	Total Rocks
26Ln3322	3	70	43	37	8	0	0	158
26Ln3323	1	7	12	7	3	7	6	42
26Ln3331	1	45	28	13	6	4	1	97

- = no information

(68 percent) have southeastern exposures. Consequently, there appears to be a good correlation between rock features and pinyon trees in the Groom Range, particularly in relatively flat areas with southeastern exposures. Later, we will examine why this may be so, but first we need to examine the nature of variability in these rock features and their most likely prehistoric function.

Rocks Around Tinajas

One rock feature in the Groom Range, 26Ln3265, has been interpreted to be a covered tinaja (Figure 5-6). Throughout the American Southwest and northern Mexico the Spanish term tinaja has been applied to cavities or depressions in bedrock that periodically fill with water (Bryan 1925:123-124). Pippin (1986b) has argued that these rock tanks were an extremely important source of water for hunters and gatherers in southern Nevada, especially in areas where more permanent sources of water (springs and seeps) were absent. On the Nevada Test Site to the southwest of the Groom Range, these tinajas are often covered with various forms of lids (rock slabs, pinyon branches, etc.) to retard evaporation and protect the water from contamination and animal consumption. The single Groom Range example consists of 14 rocks scattered around a hole in limestone bedrock which is approximately 70 cm in diameter and about 40 cm deep. These rocks may have originally held a brush or skin cover, but are now scattered up to 4.3 meters from the hole. The low frequency of aboriginally used tinajas among the Groom Range rock features is probably a consequence of the scarcity of bedrock suitable for tanks as well as general abundance of springs and seeps on this mountain range.

Windbreaks Around The Mouths of Rockshelters

Linear and semicircular rock alignments adjoin the mouths of three rockshelters in the Groom Range sample. At two of the rockshelters, both at 26Ln3097, these rock alignments consist of from six to ten relatively large (30 to 60 cm maximum dimension) rocks arranged around the southwestern or windward portion of the rockshelters' entrances. The rock alignment at the third rockshelter, 26Ln3143 (Figure 5-7), extends in a semicircular fashion around the entire entrance area. As suggested by Davis (1965:10) for similar features in the Mono Lake Basin, these rock alignments were most likely used to hold brush and/or branch windbreaks. Portions of branches were found in the rock alignment at one of the rockshelters (Division 1, Feature 1) at 26Ln3097 and domestic artifacts, including millingstones, drills, choppers, Rosegate Series projectile points and/or bifacial stage forms, occur in the artifact inventories from these sites. Similar rock alignments situated around the mouths of rockshelters are common at temporary camps on Yucca Mountain 50 mile southwest of the Groom Range as well as elsewhere on the Nevada Test Site (Pippin 1984a).

Rock Caches in Rockshelters

Although the above three rock features closely fit the model for windbreaks around habitation sites, not all rock features in the Groom Range rockshelters probably served this function. Six rock features; three at site 26Ln3135, one at site 26Ln3264, one at 26Ln3119, and one in a rockshelter east of the Condos at Division 2 of 26Ln3097, apparently served caches rather than windbreaks (Table 5-8). The most obvious of these caches occurs at Feature 1 of 26Ln3119 (Figure 5-8). There a pile of 12 rocks, mostly measuring about 20 cm in maximum dimension, occurs on a small (60 by 70 cm) shelf directly in front of a opening (50 cm in diameter) to a 2.10 meter deep hole in a bedrock cliff. Another 29 rocks, all nonindigenous to this immediate area, were discovered on the ground below the opening. These rocks were presumably used to seal the hole opening from access by rodents, birds and other unwanted intruders.

The remaining five rockshelter caches conform to a slightly different pattern (Figures 5-9, 5-10). These features consist of two to four dozen rocks scattered in piles (1.3 to 3.0 meters in outside diameter) near the rear wall of rockshelters. The three caches at 26Ln3135 are associated with a red (iron oxide) pictograph panel displaying "Great Basin Rectilinear" designs and 30 pinyon branches that may have formed part of the rock caches. Although these caches are in close proximity to a temporary campsite (Division 1 of 26Ln3135), no artifacts are directly associated with the features. Artifacts are likewise absent at the remaining two rockshelter caches.

There is little evidence concerning the nature or kind of resources that may have been cached in these rockshelters. More detailed botanical analyses (pollen, flotation, etc.) are required in order to address this question as well as to confirm the hypothesis that these features functioned as caches. Unfortunately, these rockshelter caches, consistently built on bedrock, display limited fill (<5cm) and the potential to retrieve botanical evidence is restricted. However, pollen washes from these caches may be beneficial to discerning their function.

Hunting Blinds

Only one rock feature in the Groom Range appears to be the remains of a hunting blind. This feature (Figure 5-11), located at site 26Ln3084 near Savio Spring, consists of approximately 100 rocks piled in a rectangular shaped pattern around naturally occurring boulders. The feature, built on the end of a small promontory, overlooks a modern day game trail at a drainage intersection.

Figure 5-6: View of the covered tinaja at 26Ln3265, Groom Range, Nevada.

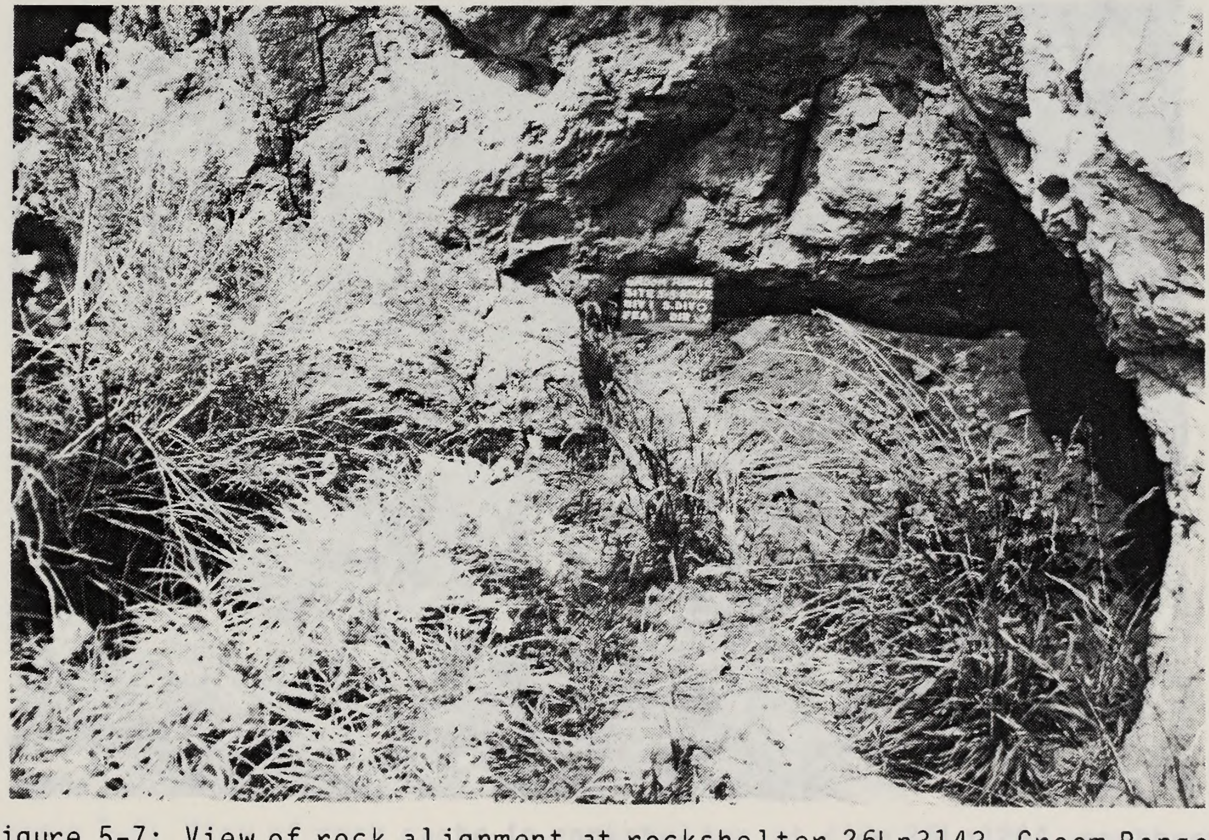

Figure 5-7: View of rock alignment at rockshelter 26Ln3143, Groom Range, Nevada.

Figure 5-8: View of rock cache in bedrock hole at 26Ln3119 near Hooter Holler, Groom Range, Nevada.

Figure 5-9: View of rock cache in rockshelter at side 26Ln3264, southern Groom Range, Nevada.

Figure 5-10: View or rock cache in rockshelter near 26Ln3097, Groom Range, Nevada.

Figure 5-11: Rock hunting blind above Savio Spring, Groom Range, Nevada.

Rock Encircled Depressions on Alluvial Fans

Eleven rock features recorded in the Groom Range (26Ln3081-1, 26Ln3121-1, 26Ln3121-3, 26Ln3121-12, 26Ln3121-13, 26Ln3121-14, 26Ln3121-15, 26Ln3145-1, 26Ln3145-2, 26Ln3312-1, 26Ln3312-2) consist of rocks surrounding depressions on alluvial fans (Figures 5-12, 5-13). These features range between 4.50 and 1.10 meters in overall diameter (mean = 2.79 meters, sd = 0.94 meters); whereas the depressions around which they were placed range between 2 meters and 30 cm in diameter (mean = 1.28 meters, sd = 0.54 meters). The current depth of the depressions range between 20 and 80 cm, but these measurements are heavily influenced by the degree of sedimentation in each depression. Similarly, these features are highly variable in the number (5 to 155) of rocks used in their construction (Table 5-10).

Nevertheless, these features may be classified into two subgroups based on their overall area: (1) large rings (26Ln3081-1 and 26Ln3312-1) which average 13.8 square meters (sd = 3 square meters) and (2) smaller rings which average 4.8 square meters (sd = 2.1 square meters) in overall area (Table 5-8). Based on analogy with a fallen conical wooden lodge recorded in Big Burn Valley on the Nevada Test Site 30 miles southwest of the Groom Range (Pippin unpublished data), it is hypothesized that the two larger rings (26Ln3081-1 and 26Ln3312-1) may have once held similar habitation structures. Ethnographic reports describe habitation structures as being between 4.5 and 16.6 square meters in area (Dutcher 1893:377; Steward 1933:334, 1941:334; Stewart 1942:256-258) and the larger depressions in the Groom Range fall well within this range. However, the smaller rock encircled depressions in the Groom Range most probably reflect caches. Again, excavations and more detailed botanical sampling are required in order to confirm this postulate and appraise the nature of cached goods. Unlike caches in rockshelters, these depressions provide a good potential for pollen and flotation analyses. Deposition in the depressions since their use would help to preserve these botanical remains.

Rock Circles

Twenty-five rock features in the Groom Range consist of simple circular or oval arrangements of rock around open centers (Tables 5-8, 5-11; Figures 5-14, 5-15, 5-16). Overall, the rock ring features from the Groom Range are similar to those reported by Pippin (1986b) for Pahute and Rainier mesas on the Nevada Test Site. The Groom Range features vary from 2.8 to 5.3 meters in maximum diameter (mean = 3.9 meters, sd = 0.7 meters) and between 0.5 and 4.0 meters in inside diameter (mean = 2.0 meters, sd = 0.8 meters). Anywhere between 23 and 158 rocks were used in their construction (Table 5-10). All are found in areas housing other cultural remains, usually in valley bottoms (56 percent) or on ridge tops (32 percent). None of these rock ring features display evidence of entrances. Four rings, Feature 1 at 26Ln3314, Feature 1 at 26Ln3321, and Features 2 and 3 at 26Ln3322, have been constructed around bedrock outcrops (Figure 5-14), but otherwise these four rings are similar to the other rings in overall configuration. Two of these rings (Feature 1 at 26Ln3096 and Feature 2 at 26Ln3322) contained fire cracked rocks, but only feature 2 at 26Ln3322 included charcoal. Most rings (76 percent) displayed evidence of some fill since their construction; however, this fill exceeds 10 cm at

Table 5-11: Wall width, inside area and overall area for simple rock circle features, Groom Range, Lincoln County, Nevada.

Site Number	Feature Number	Wall Width (meters)	Inside Area (square meters)	Overall Area (square meters)
26Ln3094	3	1.75	0.442	4.712
26Ln3096	1	1.85	3.464	11.812
26Ln3104	1	0.75	4.714	7.972
26Ln3114	1	1.40	9.621	18.732
26Ln3115	1	1.00	3.142	6.786
26Ln3116	1	1.45	3.801	10.414
26Ln3119	2	1.45	1.651	6.574
26Ln3121	2	2.45	0.567	8.545
26Ln3121	4	1.35	3.976	10.179
26Ln3121	5	1.45	1.651	6.597
26Ln3121	6	1.55	3.631	10.681
26Ln3121	7	0.95	3.464	7.257
26Ln3121	8	2.90	3.801	20.420
26Ln3121	9	2.40	2.138	12.833
26Ln3121	10	1.15	2.405	6.322
26Ln3121	11	2.30	2.138	12.205
26Ln3121	16	2.05	1.131	8.247
26Ln3313	1	1.35	2.270	7.288
26Ln3314	1	1.85	2.835	10.179
26Ln3321	1	1.65	5.940	15.080
26Ln3322	1	2.10	0.785	7.548
26Ln3322	2	3.00	1.539	14.923
26Ln3322	3	3.30	1.039	15.551
26Ln3323	1	2.15	1.887	10.744
26Ln3331	1	1.25	5.309	11.640

only four rings (Feature 2 at 26Ln3121, Feature 8 and 9 at 26Ln3121, and Feature 1 at 26Ln3331).

Although these rock circles range greatly in overall size (Table 5-11), a normal probability plot of their overall area (Figure 5-17) shows a relatively normal distribution and it is statistically unlikely that these features can be separated into subgroups using their overall size alone. Nevertheless, if these features were used to surround habitation structures, we would expect that they would have relatively thin walls and relatively open interiors. Conversely, if they functioned as rock caches, then they should have much wider walls and restricted interior areas. In order to classify the Groom Range rock rings according to this expectation, they were inspected using hierarchical cluster analysis with nearest neighbor linkage and euclidean distance (Wilkinson 1985). For this analysis the wall width and inside areas were standardized using their z scores. The analysis (Figure 5-18) defined two easily recognizable groups.

Figure 5-12: Rock encircled depression on alluvial fan at site 26Ln3121 in Hooter Holler, Groom Range, Nevada.

Figure 5-13: Rock encircled depression on an alluvial fan at site 26Ln3145 near Rock Spring, eastern Groom Range, Nevada.

Figure 5-14: Stone circle built against a bedrock outcrop at site 26Ln3322, Groom Range, Nevada.

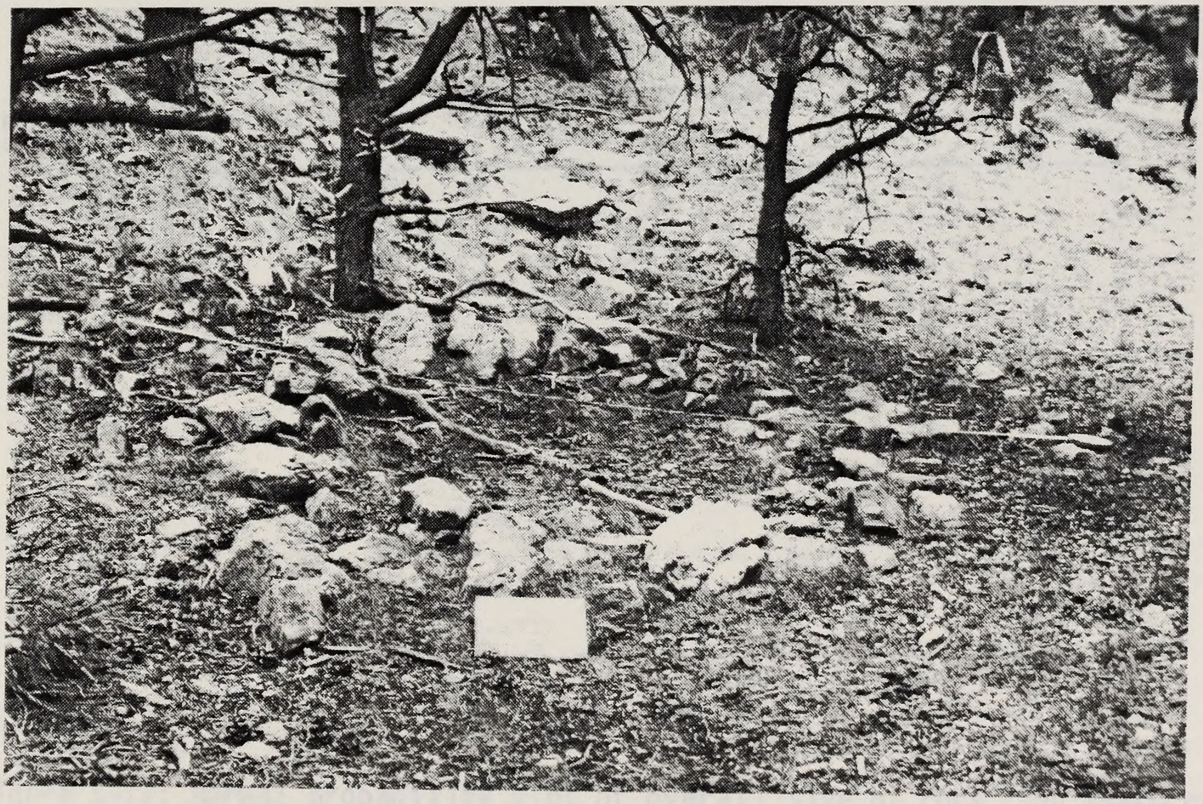

Figure 5-15: Open rock ring at site 26Ln3121 in Hooter Holler, Groom Range, Nevada.

Figure 5-16: Rock circle feature at 26Ln3121 in Hooter Holler, eastern Groom Range, Nevada.

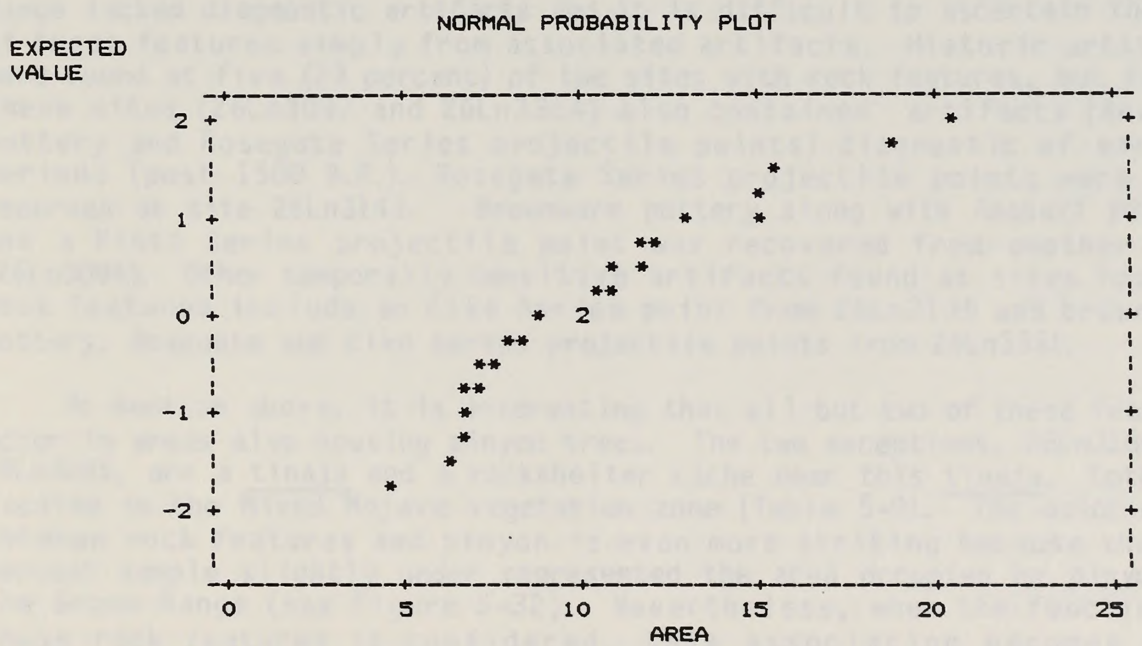

Figure 5-17: Normal probability plot of overall size of rock ring features in the Groom Range, Nevada. A normal distribution would lie on a straight line.

The first group, including Feature 1 at 26Ln3104, Feature 1 at 26Ln3114, Feature 1 at 26Ln3116, Features 4 and 6 at 26Ln3121, Feature 1 at 26Ln3321 and Feature 1 at 26Ln3331, is characterized by comparatively narrow walls (mean = 1.34 meters) and large inside areas (mean = 5.28 square meters). The second group, comprised of the remaining 18 features, have only slightly wider walls (mean = 1.97 meters) but much smaller inside areas (mean = 2.02 square meters). Based on this analysis, it is suggested that the seven rock ring features included in Cluster 1 may be habitation structures; whereas the remaining 18 rock circle features are probably rock caches. Millingstones were found in direct association with the rings at Feature 1 at 26Ln3321 and Feature 1 at 26Ln3331 and this co-occurrence of domestic artifacts and rings tends to confirm their classification as habitation structures.

Discussion

In conclusion, the rock ring features recorded in the Groom Range appear to reflect several different functional and social activities. Water management is reflected by the ring at 26Ln3265; whereas habitation activities are apparently manifested by the six windbreaks at rockshelters, the two large rings around depressions in alluvial fans at 26Ln3081-1 and 26Ln3312-1 and by the above cluster of seven rock rings that are characterized by comparatively narrow walls and large inside areas. Caches in rockshelters occur at 26Ln3119-1, 26Ln3135 (3 ea), 26Ln3264, and 26Ln3097, but most features interpreted to be caches are now reflected by open rock rings in valley bottoms or on ridge tops. Finally, the only feature that may reflect hunting activities occurs at the hunting blind recorded at 26Ln3084.

Over half (54 percent) of the sites housing rock features in the Groom Range lacked diagnostic artifacts and it is difficult to ascertain the age of these features simply from associated artifacts. Historic artifacts were found at five (23 percent) of the sites with rock features, but two of these sites (26Ln3097 and 26Ln3314) also contained artifacts (Anasazi pottery and Rosegate Series projectile points) diagnostic of earlier periods (post 1500 B.P.). Rosegate Series projectile points were also recorded at site 26Ln3143. Brownware pottery along with Anasazi pottery and a Pinto Series projectile point was recovered from another site (26Ln3094). Other temporally sensitive artifacts found at sites housing rock features include an Elko Series point from 26Ln3135 and brownware pottery, Rosegate and Elko series projectile points from 26Ln3331.

As mention above, it is interesting that all but two of these features occur in areas also housing pinyon trees. The two exceptions, 26Ln3264 and 26Ln3265, are a tinaja and a rockshelter cache near this tinaja. Both are located in the Mixed Mojave vegetation zone (Table 5-9). The association between rock features and pinyon is even more striking because the six percent sample slightly under represented the area occupied by pinyon in the Groom Range (see Figure 5-32). Nevertheless, when the function of these rock features is considered, this association becomes more understandable. While pinyon provides a high bulk resource which is able to support larger, more stable populations, it requires storage. All but two of the rock features in the Groom sample have been interpreted to reflect either the remains of habitation structures or caches, both of which are required for the exploitation of pinyon.

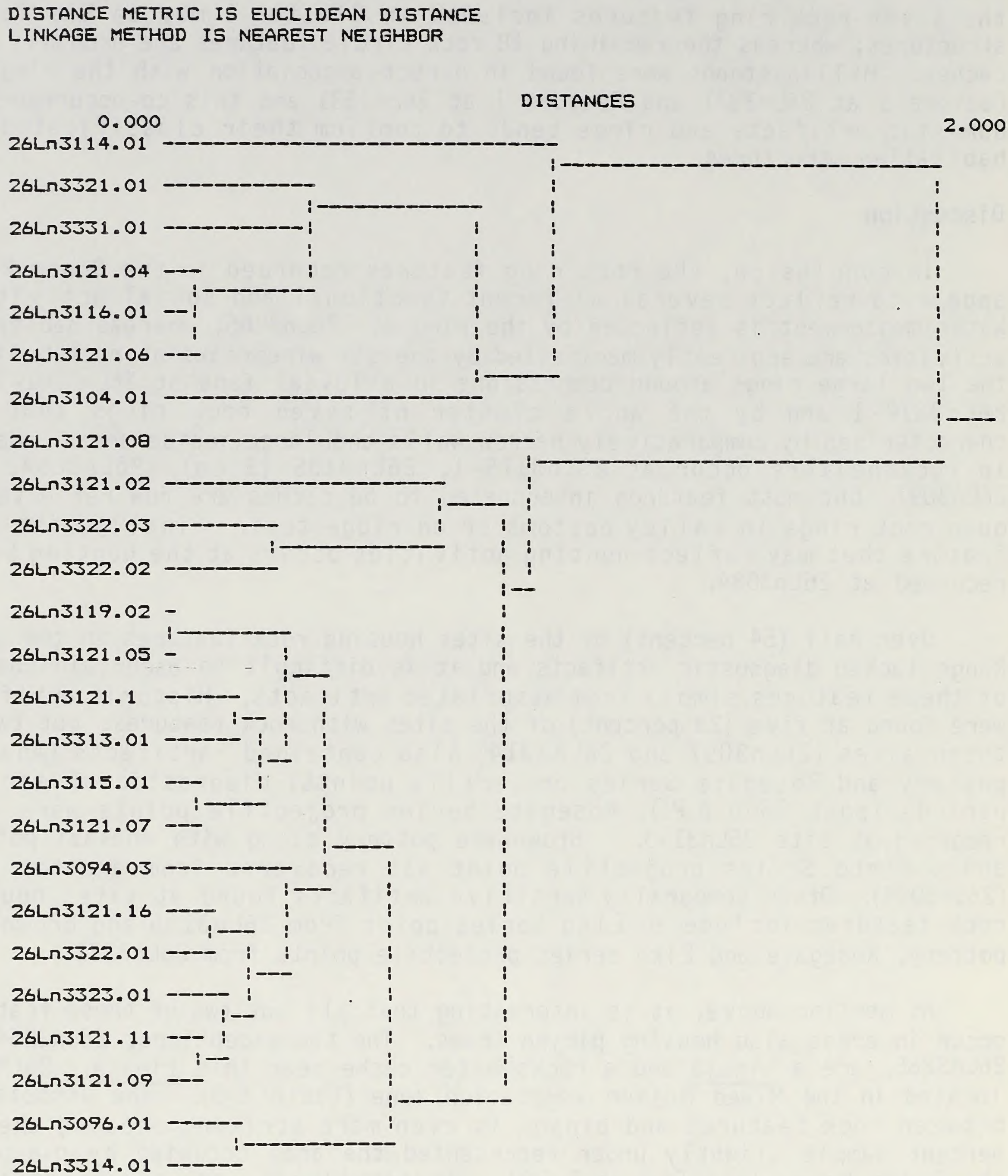

Figure 5-18: Dendrogram of hierarchical cluster analysis of wall width and inside ring area for rock ring features in the Groom Range, Nevada.

Rock Art

Three rock art sites were found in the Groom Range sample. These rock art panels are pictographs in red pigment associated with large archaeological sites. A large rockshelter at site 26Ln3094 contains a small panel consisting of several faint vertical stripes. One of the rockshelters (Feature 1-0-3) at The Condos (Site 26Ln3097), contains a panel with numerous short straight lines and a limited number of simple curved designs that appear to be applied by a finger (Figure 5-19C) Finally, Site 26Ln3135 has a panel at the rear of a small alcove located above a large shelter housing rock caches. Designs here are more complex than at the other sites and are composed entirely of straight lines (Figure 5-19C). All these sites with pictographs contain evidence of extensive occupation including lithic scatters, caches, millingstones and hearths.

The remaining style of rock art in the Groom Range is represented by an incised stone found at a large lithic scatter (Site 26Ln3336) below Cattle Spring. The stone is a 16 x 10 cm slab of red shale with two zigzag lines lightly incised on one surface (Figure 5-19A). High points of this surface have also been lightly ground. Trudy Thomas (1983:332) has examined similar incised stones in the Great Basin and hypothesizes they reflect a "dramatization of sequential and periodic socio-economic behavior of their makers." The Groom specimen appears to be similar to other incised stones that Thomas identifies as the Central Style.

Rockshelters

Despite the precipitous nature of the Groom Range, only 21 rockshelters were recorded. These shelters are summarized in Table 5-12 and selected examples are shown in Figures 5-20 to 5-22, and 5-9. A wide diversity of activities are represented in these shelters and material culture most commonly involves a combination of discarded debitage (63.16 percent), food preparation (57.89 percent), and/or special task related artifacts (42.11 percent). Rock alignments, apparently used to hold brush or otherwise provide protection from the elements, occur in three (15.79 percent) of the rockshelters. The rockshelters in the Groom Range sample most likely reflect temporary camps.

Rockshelters are especially important because of their potential to house perishable artifacts and biological specimens normally missing at open sites. Evidence of hearths was observed at five (26.32 percent) rockshelters, and most shelters displayed a potential to contain buried cultural remains. Seven, in fact, may have up to a meter or more of Holocene deposition.

The most impressive rockshelter complex in the Groom Range occurs at The Condos (26Ln3097). This complex includes nine rockshelters (Figures 5-22, 5-23) located at the end of a south-facing ridge in Hamel Valley. Here they are next to a major route across the Groom Range. This context along with evidence of Holocene deposition indicate that this site has an excellent potential for stratified cultural remains. Diagnostics observed at the site include: pictographs, Euroamerican artifacts, Anasazi pottery, and Rosegate Series projectile points. Artiodactyl bones and wooden shafts, possibly arrow shafts, indicate that some perishable remains may be in association with the shelters.

Table 5-12: Selected attributes of Rockshelters in the Groom Range.

Site-Div-SubD-Feat	Food Prep	Hearth	Spec Task	Bi-Face	Adorn-ment	Habit-ation	Hunting	Cache	Area (sq. m.)	Toolstone	Depth (cm)
26Ln3093-1-0-1	4	-	h	-	-	-	-	-	60	3	20-100
26Ln3095-1-0-1	1	-	-	-	-	-	-	-	25	3	1-5
26Ln3097-1-0-1	-	-	-	-	-	-	-	-	4	-	>100
26Ln3097-1-0-2	-	-	1ac	-	-	-	-	-	210	-	0-20
26Ln3097-1-0-4	4	1ab	1	1	-	-	3	-	30	5	?
26Ln3097-1-1-1	2	-	-	-	-	d	1	-	14	1	?
26Ln3097-1-2-1	2	-	-	-	-	-	-	-	8	-	?
26Ln3097-1-3-1	1	-	f	1	-	d	-	-	4	2	>100
26Ln3097-1-4-1	-	-	-	-	-	-	-	-	14	2	>100
26Ln3097-1-5-1	-	-	g	-	-	-	-	-	12	-	>100
26Ln3097-1-6-1	1	-	-	-	-	-	-	-	300	-	?
26Ln3129-1-0-1	3	1a	1	-	-	-	-	-	8	1	20-100
26Ln3143-1-0-1	1	1a	-	-	-	d	1	-	48	4	80
26Ln3188-1-0-1	-	-	-	-	-	-	-	-	2	2	0
26Ln3188-1-0-2	-	-	-	-	-	-	-	-	1	1	0
26Ln3262-1-0-1	4	1b	1	-	-	-	-	-	30	1	0-20
26Ln3264-1-0-1	-	-	-	-	-	-	-	1	?	-	?
26Ln3297-1-0-1*	3	1	-	1	-	-	-	-	?	3	20-100
26Ln3297-2-0-1	-	-	c	-	-	-	-	3	50	-	5-10

a - Fire Cracked Rock
b - Burned Bone
c - Pictographs
d - Rock Alignment
e - Cleared Area
f - Can - unknown function
g - Cow Horn
h - Perforated Stick

*Artifacts for 3 rockshelters at the base of a boulder have been tabulated together.

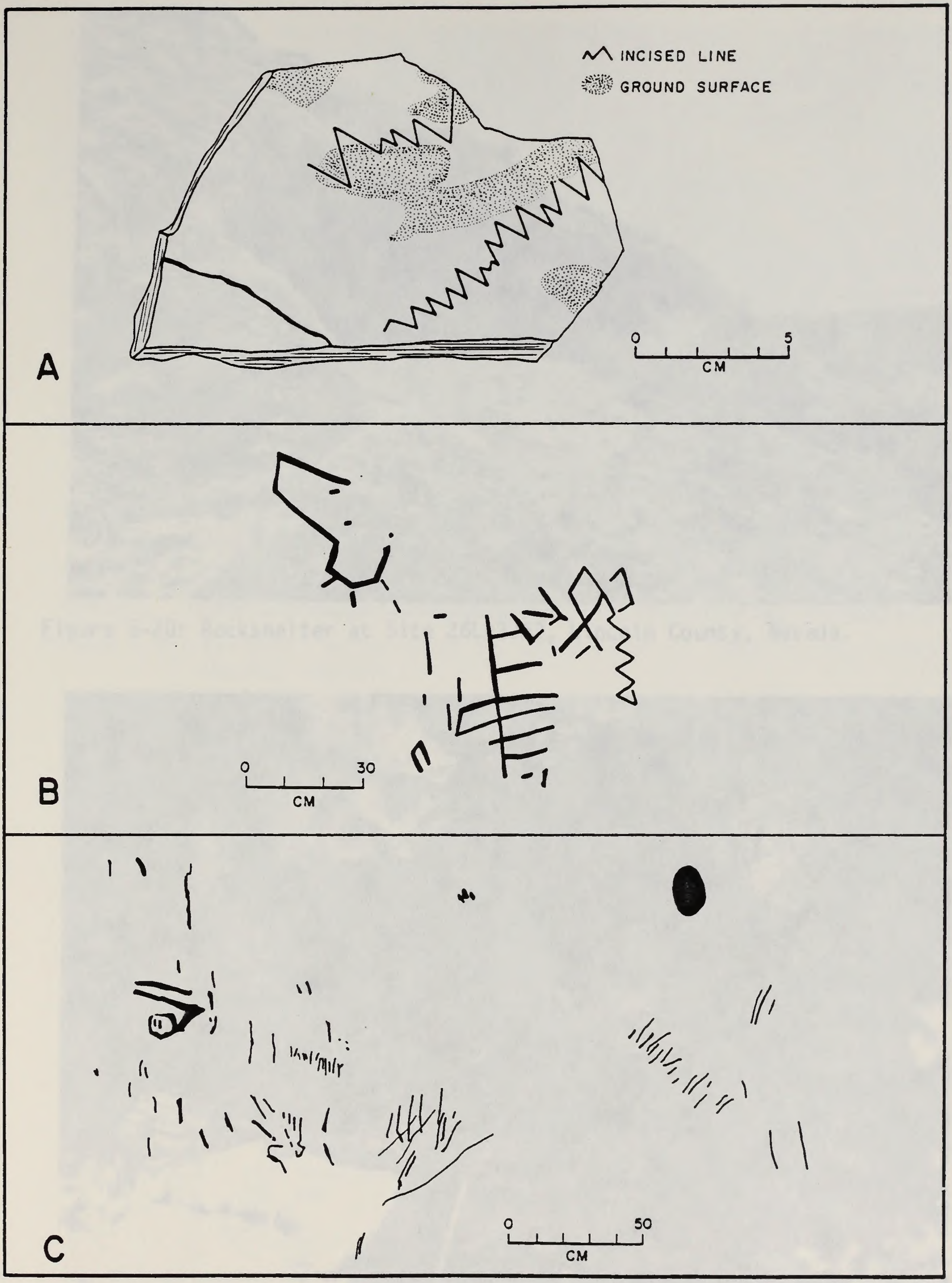

Figure 5-19: Incised stone from site 26Ln3336 (A), and pictographs at sites 26Ln3135 (B), and 26Ln3097 (C), Groom Range, Lincoln County, Nevada.

Figure 5-20: Rockshelter at Site 26Ln3262, Lincoln County, Nevada.

Figure 5-21: Rockshelter at Site 26Ln3129, Lincoln County, Nevada.

Figure 5-10. Rockshelter at Site 26Ln3582, Lincoln County, Nevada.

Figure 5-11. Rockshelter at Site 26Ln1279, Lincoln County, Nevada.

Figure 5-22: Rockshelter at Site 26Ln3097 (Div. 1, SubDiv. 4), Lincoln County, Nevada.

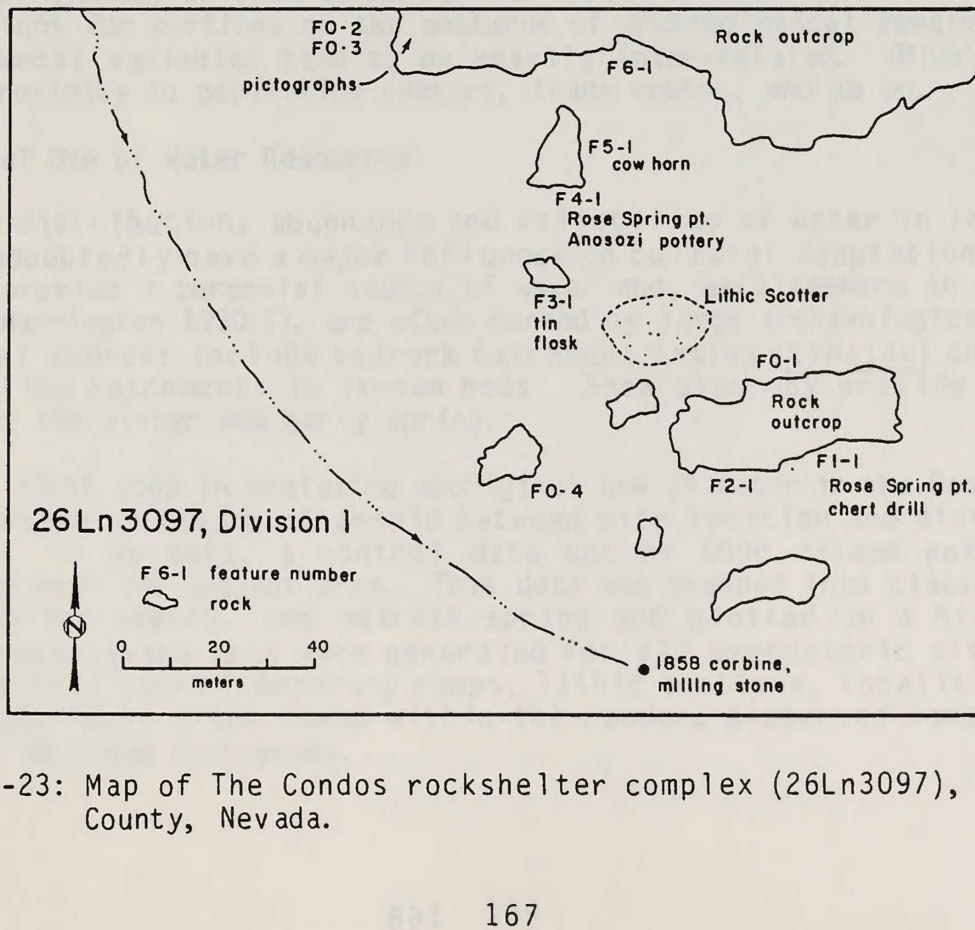

Figure 5-23: Map of The Condos rockshelter complex (26Ln3097), Lincoln County, Nevada.

Distributions of Prehistoric Archaeological Sites

The existing sample reflects that archaeological sites are not uniformly distributed in the Groom Range (Figure 5-1). In an attempt to obtain a clearer image of archaeological site density throughout the Groom Range, we used the SYMAP program to project a site density map for the entire project area (Figure 5-24). The data used for this SYMAP contour map consisted of the sum of the area covered by all sites within each sample unit. The SYMAP program interpolates values among the irregularly placed data points and prints out a shaded map. We selected 5 shadings to represent values from no sites (blank) to sites covering from more than 1099.56 to 5497.78 ares (black). Details on the ranges of site area and the number of sample units falling in each shading interval are presented facing Figure 5-24. This map can be regarded as a rough archaeological sensitivity map for the project area. The general pattern should be fairly accurate due to the uniformity in sampling technique throughout the project and the dispersed nature of the sample. However, the projection is hampered by the relatively small sample size (6 percent) and the fact that SYMAP works with maximum accuracy over a plain surface with minimum variability between adjacent data points.

Figure 5-24 shows a large site concentration in the northeast part of the range along the belt of springs north of Quail Spring. Smaller concentrations occur below Bullwhack Spring in the northwest part of the study area, surrounding Cattle Spring and near Indian Springs in the west central portion of the range, and in the area east of Groom Lake. The blank areas in Figure 5-24 should be interpreted as areas of very low probable density, not as areas where there are no archaeological remains. Due to the close relationship between man and environment in hunting and gathering cultures, a study of environmental variables often leads to plausible explanations for portions of the patterns of archaeological remains. Such environmental variables tend to be heavily inter-related. Other reasons can be proximity to population centers, trade routes, and so on.

Aboriginal Use of Water Resources

The distribution, abundance and reliability of water in the Groom Range undoubtedly have a major influence on cultural adaptations there. Springs provide a perennial source of water and, as elsewhere in southern Nevada (Harrington 1930:5), are often marked by large archaeological sites. Ephemeral sources include bedrock catchment basins (tinajas) and small sand-filled catchments in stream beds. Snow also may provide a water source in the winter and early spring.

The first step in analyzing aboriginal use of water in the Groom Range was to determine the relationship between site location and distance to springs. To do this, a control data set of 5000 random points was generated over the project area. This data was grouped into classes based on 500 m increments from nearest spring and plotted on a histogram. Similar histograms then were generated for all prehistoric sites, and selected site types (temporary camps, lithic scatters, localities, and isolates). Only sites found within the random, dispersed sample were included in these histograms.

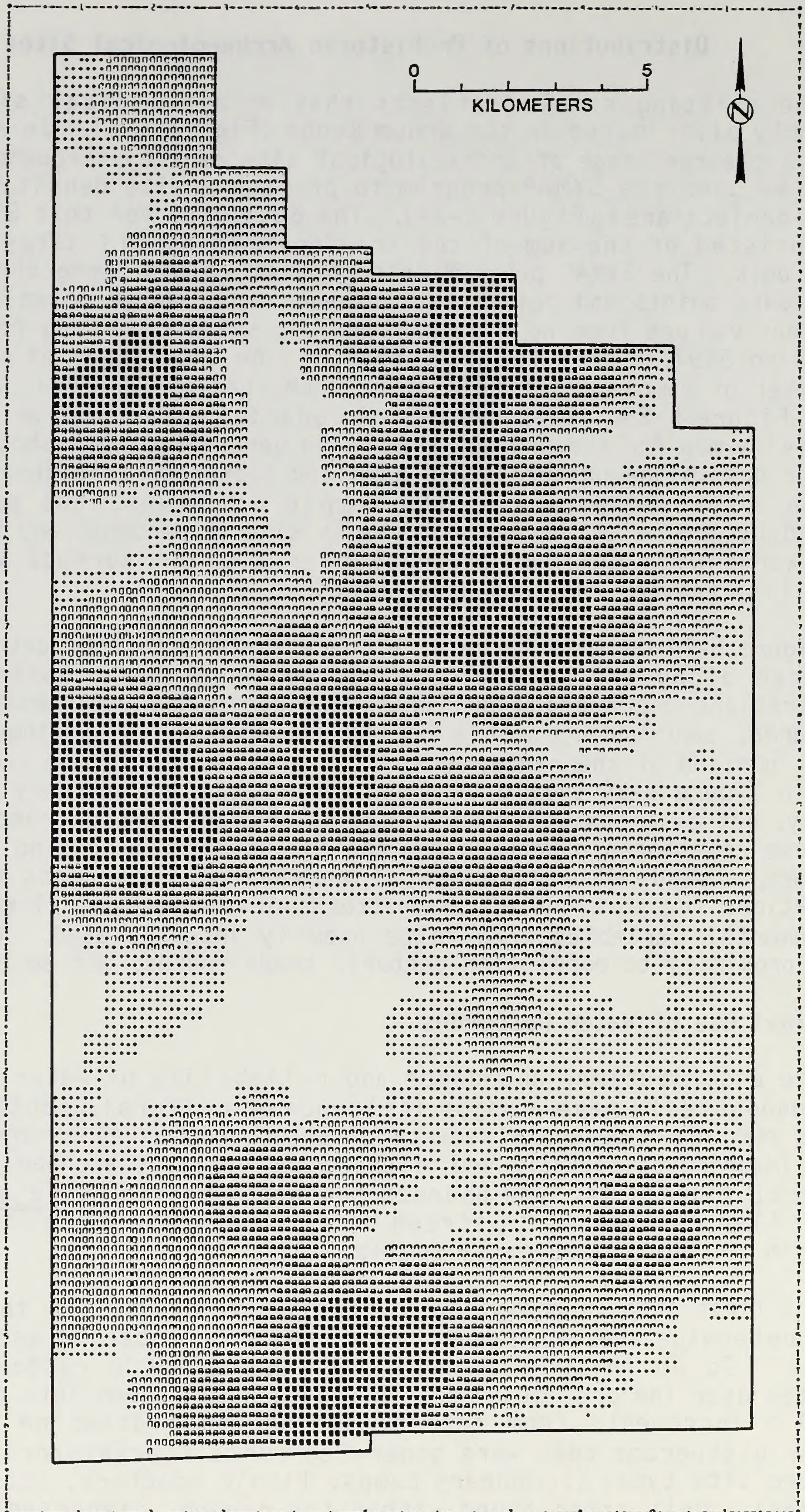

Figure 5-24: SYMAP projection of archaeological site density in the Groom Range, Lincoln County, Nevada

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GROOM RANGE ARCHAEOLOGICAL PROJECT

SITE AREA DISTRIBUTION




DATA VALUE EXTREMES ARE          0.00      5497.78


ABSOLUTE VALUE RANGE APPLYING TO EACH LEVEL
     (*MAXIMUM* INCLUDED IN HIGHEST LEVEL ONLY)

  MINIMUM        0.00         .01        2.75       98.96     1099.56
  MAXIMUM         .01        2.75       98.96     1099.56     5497.78


PERCENTAGE OF TOTAL ABSOLUTE VALUE RANGE APPLYING TO EACH LEVEL

                  .00         .05        1.75       18.20       80.00


FREQUENCY DISTRIBUTION OF DATA POINT VALUES IN EACH LEVEL
  LEVEL          1           2           3           4           5
         ***********************************************************
                         +++++++++   OOOOOOOOO   ΘΘΘΘΘΘΘΘΘ   █████████
                         +++++++++   OOOOOOOOO   ΘΘΘΘΘΘΘΘΘ   █████████
  SYMBOLS                +++++++++   OOOOOOOOO   ΘΘΘΘΘΘΘΘΘ   █████████
                         +++++++++   OOOOOOOOO   ΘΘΘΘΘΘΘΘΘ   █████████
                         +++++++++   OOOOOOOOO   ΘΘΘΘΘΘΘΘΘ   █████████
         ***********************************************************
  FREQ.          22          26          20          10           8
      1      I       I    I+++++I     IOOOOOI     IΘΘΘΘΘI     I█████I
      2      I       I    I+++++I     IOOOOOI     IΘΘΘΘΘI     I█████I
      3      I       I    I+++++I     IOOOOOI     IΘΘΘΘΘI     I█████I
      4      I       I    I+++++I     IOOOOOI     IΘΘΘΘΘI     I█████I
      5      I       I    I+++++I     IOOOOOI     IΘΘΘΘΘI     I█████I
      6      I       I    I+++++I     IOOOOOI     IΘΘΘΘΘI     I█████I
      7      I       I    I+++++I     IOOOOOI     IΘΘΘΘΘI     I█████I
      8      I       I    I+++++I     IOOOOOI     IΘΘΘΘΘI     I█████I
      9      I       I    I+++++I     IOOOOOI     IΘΘΘΘΘI
     10      I       I    I+++++I     IOOOOOI     IΘΘΘΘΘI
     11      I       I    I+++++I     IOOOOOI
     12      I       I    I+++++I     IOOOOOI
     13      I       I    I+++++I     IOOOOOI
     14      I       I    I+++++I     IOOOOOI
     15      I       I    I+++++I     IOOOOOI
     16      I       I    I+++++I     IOOOOOI
     17      I       I    I+++++I     IOOOOOI
     18      I       I    I+++++I     IOOOOOI
     19      I       I    I+++++I     IOOOOOI
     20      I       I    I+++++I     IOOOOOI
     21      I       I    I+++++I
     22      I       I    I+++++I
     23                   I+++++I
     24                   I+++++I
     25                   I+++++I
     26                   I+++++I
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Figure 5-24 (Continued) Key to SYMAP

The histogram of the 5000 random points takes the form of a Poisson distribution with the largest number of points in the three classes representing the range of 1 to 2.5 km from the nearest spring (Figure 5-25). This distribution is not matched in any of the histograms of archaeological data. Prehistoric sites are distinctly clustered within a kilometer of the nearest spring (Figure 5-26) and are generally scattered beyond this distance. The histogram for temporary camps is particularly interesting (Figure 5-27). All temporary camps fall within 3 km of a spring except one that is between 3.5 and 4 km distant, indicating a possible preference for areas close to springs. Unfortunately, the number of temporary camps is sufficiently low that the lack of sites further from springs may be due to sample size. However, the quantities of lithic scatters, localities, and isolates are sufficiently large enough to provide more convincing histograms (Figures 5-28, 5-29, 5-30). In all three cases, there is a distinct clustering of sites within a one km radius of the nearest spring and then a continued presence of the site types at greater distances. The persistent clustering of sites in the 6.5 and 7 km classes in the histograms for all sites, lithic scatters, and isolates (Figures 5-26, 5-28, 5-30) is due to concentrations of archaeological remains in the southeast corner of the project area, primarily in areas of eolian sand.

A high-low graph showing the relation of all prehistoric site types and distance to springs is shown in Figure 5-31. Caches are most closely associated with springs. This may be the result of cached food supplies in residential bases around these springs. Temporary camps and quarries are also closely associated with springs. The spatial relationship of temporary camps to springs is expected; but the association of quarries with springs is probably fortuitous. Other site types, although more numerous, are relatively scattered throughout the project area Figure 5-31.

The quality of water at any particular source also may be an important consideration for aboriginal use. Springs with greater water discharge should not only attract larger populations, but also may be least sensitive to fluctuations in rainfall (ground water recharge) and therefore more reliable. In order to test this hypothesis, springs were divided into three classes based on discharge rates, and all sites in sample quadrats within a 1 km radius of each spring were tabulated (Table 5-13). The total number of sites for each spring, was divided by the number of quadrats within the 1 km radius. The quotients for each spring, then, were averaged for each spring class. Springs with 1-10 liters/minute discharge averaged 3.11 sites per spring, those with 11-20 l/minute discharge averaged 4 sites, and the two springs with greater than 20 l/minute discharge averaged 6 sites per spring. Intuitive sampling enhances this pattern of greater aboriginal use with increased spring discharge. Two of the least productive springs in the project area are Disappointment and Miner Springs. Both of these springs were visited during the intuitive survey, and both lack the plentiful aboriginal remains found at the larger spring.

Elevation and Vegetation Zones

Great Basin archaeologists have often assumed that the prehistoric exploitation of plant resources, particularly pinyon, can be inferred from the association between archaeological sites and existing vegetation communities (Bettinger 1975, 1976, 1981; Thomas and Bettinger 1976; Madsen 1981). The vegetation zones in the Groom Range do provide distinct sets of food resources and, based on the above assumption, the site density map (Figure 5-24) indicates that resources may have been exploited in a variety of different vegetational zones. In order to further examine the association between vegetational zones and archaeological sites it is interesting to compare the frequency and kinds of archaeological sites found within each major plant community.

First, the percentage of the archaeological sample in each vegetation zone was compared to the percentage of the study area covered by that community (Figure 5-32). This comparison showed that the dispersed sample design succeeded in sampling a representative proportion of all vegetation communities. A similar comparison of sampled areas within 1000 foot elevation zones revealed that the sample is also generally representative of changes in elevation in the Groom Range. However, the 5000-6000 foot elevation zone was slightly over-represented and the 6000-7000 foot zone was slightly under-represented in our sample (Figure 5-33).

Archaeological sites fall in most vegetative communities in about the same proportion as would be expected from the area covered by the communities with two exceptions (Figure 5-34). The pinyon-juniper community has fewer sites (12.89 percent) than would be expected from a random site distribution with about 22 percent of the project area in the community. However a large (36.00) percentage of the 25 sites in the Pinyon-Juniper community are temporary camps which is probably a result of the potential for pinyon nuts to be harvested and stored in bulk in this community (Figure 5-35). Site density in the mixed Mojave community is relatively high, with 22.16 percent of the sites in the sample occurring in a community which only covers 11.41 percent of the project area. But, the types of sites present in the mixed Mojave community are radically different from those in the pinyon-juniper zone. Temporary camps are absent in the mixed Mojave while 20 (46.51 percent) of the 43 sites are isolates. The sagebrush community matches most closely the pattern of site types present for the entire project area (Figure 5-35). The main deviation in the blackbrush community is the lack of temporary camps.

A comparison of elevation zones and the sites present within them shows that the 4000 to 5000 foot zone was a popular zone for aboriginal activities, but the 6000 to 7000 foot zone was seldom utilized. Other elevational zones were utilized in about the same proportions as would be expected from a uniform site distribution (Figure 5-36). The selection for the lower zone corresponds to the sandy area near Groom Lake. This influence of substrate also partially explains the selection for the mixed mojave vegetation zone. A comparison site types in the four elevation zones that encompass most of the project area with all site types present in the Groom Range is shown in Figure 5-37. The 4000 to 5000 foot zone contains a pattern of site types similar to that of the entire project area except for a lack of temporary camps. The 5000 to 6000 foot zone contains an abundance of isolates (47.22 percent) and lacks temporary camps. The 6000 to 7000 foot zone contains a diversity of site types, in roughly the appropriate proportions. Although the total quantity of sites is smaller, sites tend to be more complex, including a large proportion (27 percent) of lithic scatters and 7 (16 percent) temporary camps. The 7000 to 8000 foot zone has few isolates, with small sites represented by slightly more complex localities. Although the number of temporary camps in this zone is the same as in the previous zone, the small quantity of sites in the 7000

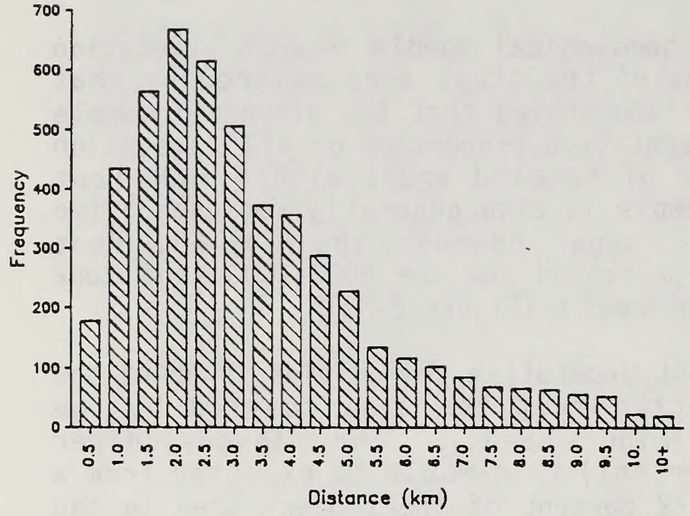


Figure 5-25:
Distances of 5000 random points to nearest spring.

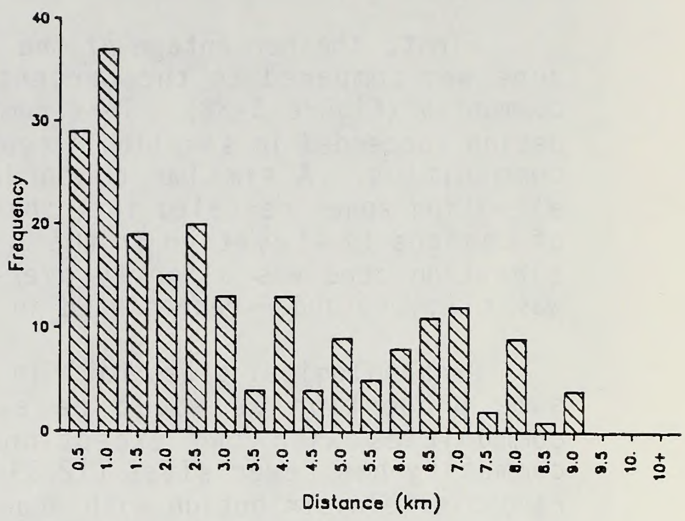


Figure 5-26:
Frequency distribution of distances between all prehistoric sites in the Groom Range and nearest spring.

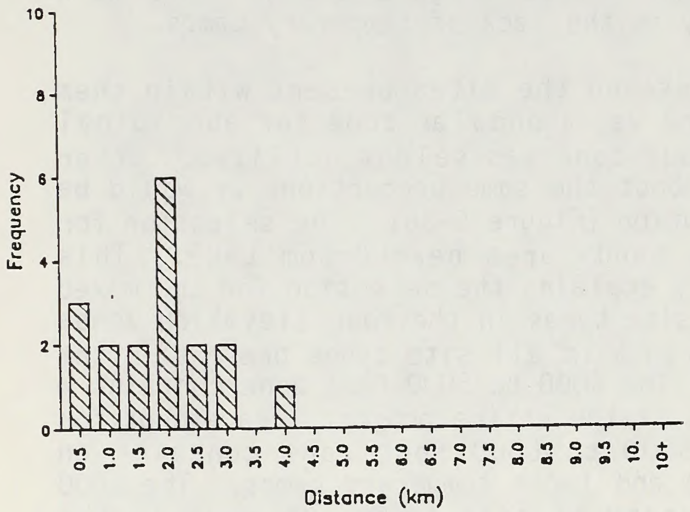


Figure 5-27:
Frequency distributions of distances between all temporary camps in the Groom Range and nearest spring.

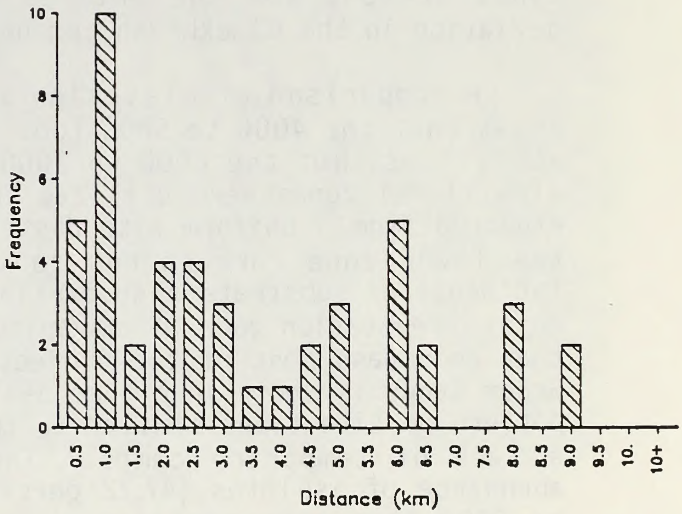


Figure 5-28:
Frequency distribution of distances between all lithic scatters in the Groom Range and nearest spring.

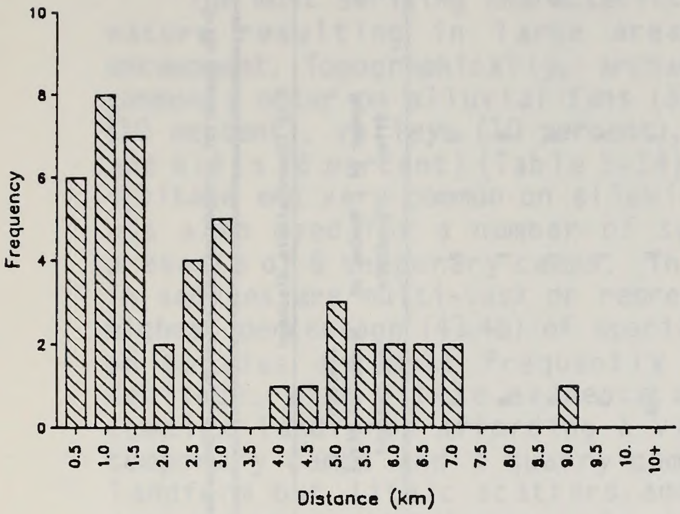


Figure 5- 29:
Frequency distribution of distances between all localities in the Groom Range and nearest spring.

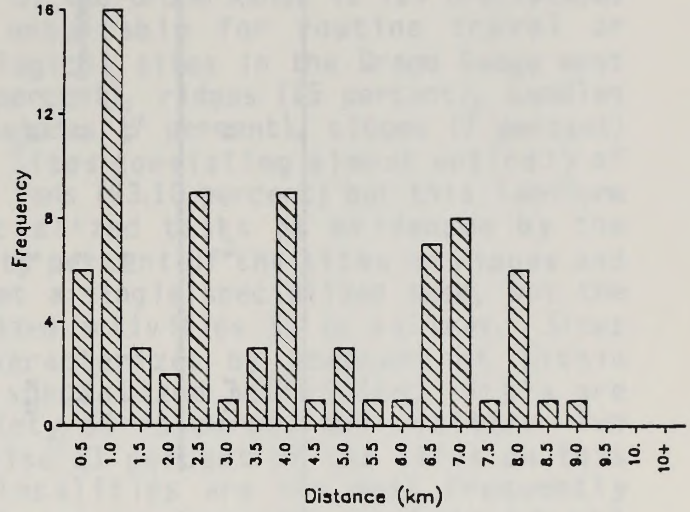


Figure 5-30:
Frequency distribution of distances between all isolates in the Groom Range and nearest spring.

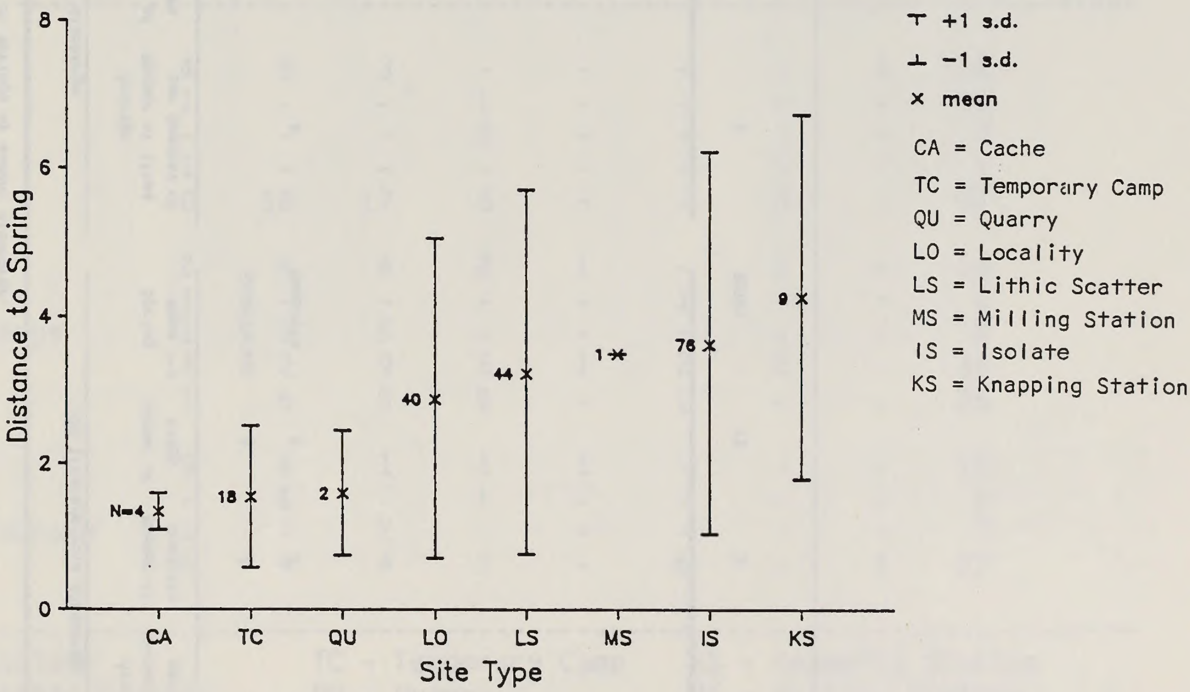


Figure 5-31: High-low graph of mean distances between all prehistoric site types in the Groom Range and nearest spring.

Table 5-13: Number of archaeological sites in the Groom Range in quadrats within 1 kilometer of springs by amount discharge.

1-10 liters/minute dischage				11-20 liters/minute discharge				>20 liters/minute discharge			
Spring Name	Number of Sites	Number of Quadrats	Average Number of Sites per Quadrat	Spring Name	Number of Sites	Number of Quadrats	Average Number of Sites per Quadrat	Spring Name	Number of Sites	Number of Quadrats	Average Number of Sites per Quadrat
Lick	8	2	4	Rosebud	No Data			Rabbitbrush	6	1	6
Pine	8	1	8	Savio	8	2	4	Naquinta	6	1	6
Indian	0	1	0								
Quail	6	2	3								
Cliff	2	3	.66								
Cattle	1	1	1								
Cane	10	3	3.33								
Disappointment	12	3	4								
Miner	12	3	4								
TOTAL	59	19	3.11	TOTAL	8	2	4	TOTAL	12	2	6

to 8000 foot zone makes the temporary camps a highly significant percentage (31.82) of the total.

Topography

The most striking characteristic of the Groom Range is its precipitous nature resulting in large areas unsuitable for routine travel or encampment. Topographically, archaeological sites in the Groom Range most commonly occur on alluvial fans (36 percent), ridges (15 percent), saddles (10 percent), valleys (10 percent), bajadas (7 percent), slopes (7 percent) and hills (6 percent) (Table 5-14). Sites consisting almost entirely of debitage are very common on alluvial fans (93.10 percent) but this landform was also used for a number of specialized tasks as evidenced by the presence of 6 temporary camps. Thirty percent of the sites on ridges and in saddles are multi-task or represent a single specialized task, but the highest percentage (43.48) of specialized activities is in valleys. Sites on bajadas are most frequently characterized by scatters of lithic debitage, with little evidence of specialized activities. Hills are complex landforms affording a variety of resources and shelter. Two temporary camps and a quarry comprise 21 percent of the sites on this landform but lithic scatters and localities are the most frequently encountered site types. In contrast one percent or less of all archaeological sites occur on benches, cliffs, dunes, peaks, alluvial terraces, or at springs. Sites near the Groom Lake playa edge comprise 4 percent of all sites and are almost entirely marked by flake debitage.

Table 5-14: Landform and site type in the Groom Range, Lincoln County, Nevada.

Landform	IS	LS	LO	TC	QU	CA	KS	MS	ALL
Bajada	4	8	3	-	-	-	-	1	16
Beach	1	-	-	1	-	-	-	-	2
Cliff	-	-	-	2	-	-	-	-	2
Dune	1	-	-	-	-	-	-	-	1
Fan	40	18	17	6	-	-	6	-	87
Hill	2	4	4	2	1	-	1	-	14
Peak	1	-	-	-	-	1	-	-	2
Playa edge	1	3	5	-	-	-	-	-	9
Ridge	14	2	9	5	1	2	2	-	35
Saddle	1	6	8	9	-	1	-	-	25
Slope	9	6	1	1	1	-	-	-	18
Spring	-	1	-	1	-	-	-	-	2
All. Terrace	1	-	2	-	-	-	-	-	3
Valley	5	4	4	3	-	6	-	1	23

IS - Isolate
LS - Lithic Scatter
LO - Locality
TC - Temporary Camp
QU - Quarry
CA - Cache
KS - Knapping Station
MS - Milling Station
ALL - All site types

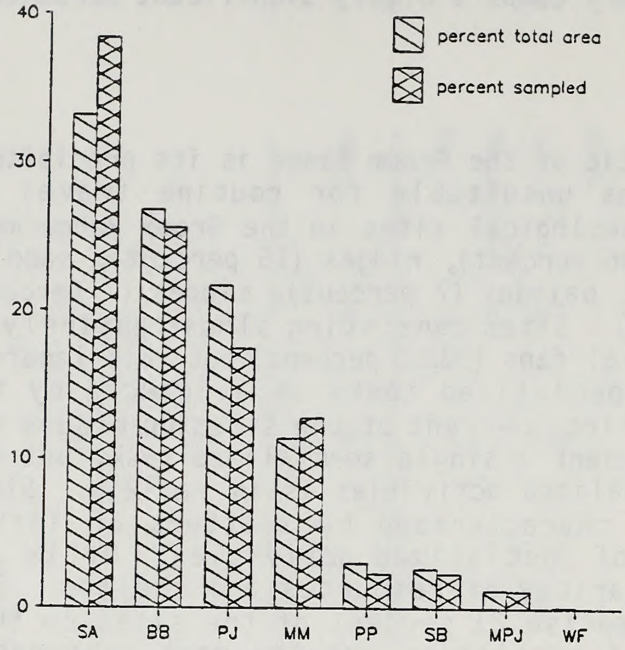


Figure 5-32:
Comparison of percentages of study area and percentage of archaeological sample within each vegetation community in the Groom Range.

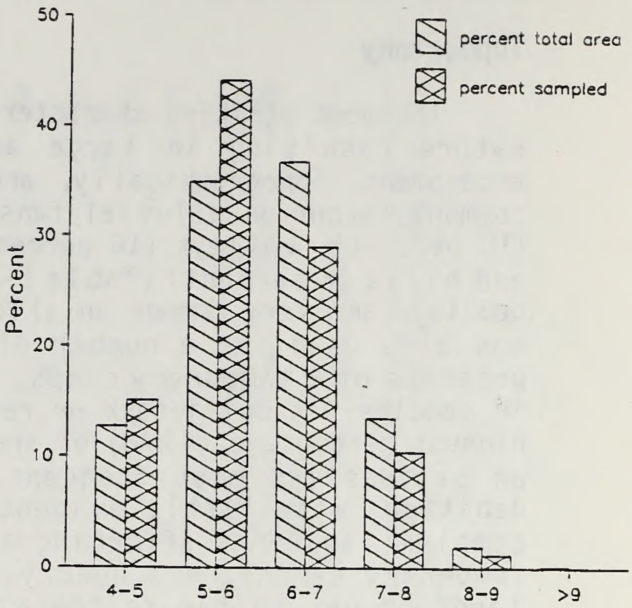


Figure 5-33:
Comparison of percentages of study area and percentage of archaeological sample units in elevation zones.

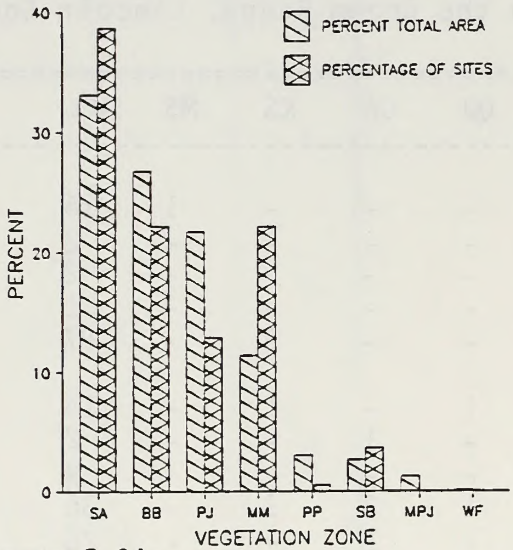


Figure 5-34:
Site distribution of prehistoric archaeological sites in vegetation communities in the Groom Range.

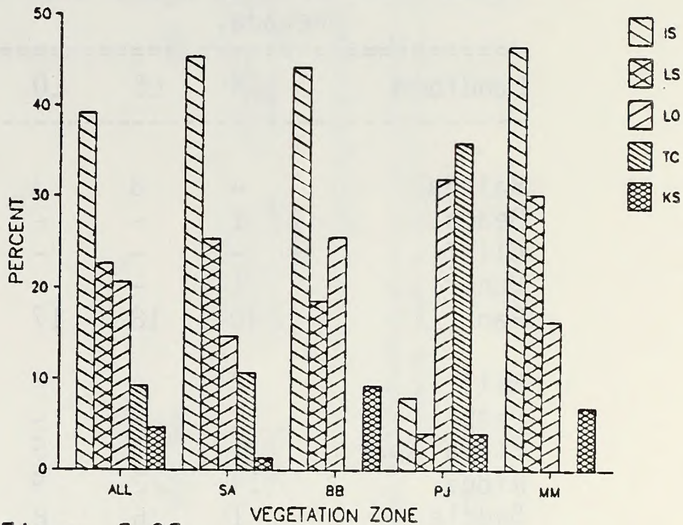


Figure 5-35:
Prehistoric site types present in major vegetation communities in the Groom Range, Lincoln County, Nevada.

SA = Sagebrush
BB = Blackbrush
PJ = Pinyon-Juniper
MM = Mixed Mojave
PP = Pinyon Pine
SB = Saltbush
MPJ = Mahogany-Pinyon-Juniper
WF = White Fir
IS = Isolate
LS = Lithic Scatter
LO = Locality
TC = Temporary Camp
KS = Knapping Station

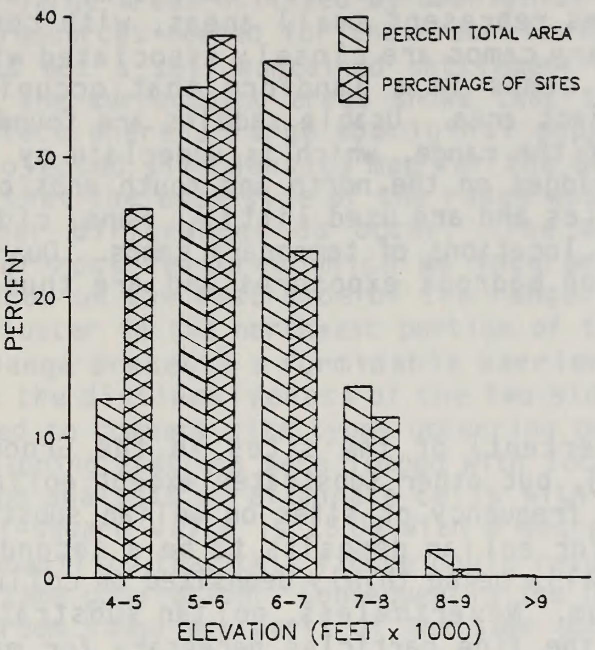


Figure 5-36: Percentages of prehistoric archaeological sites in elevation zones in the Groom Range, n = 194.

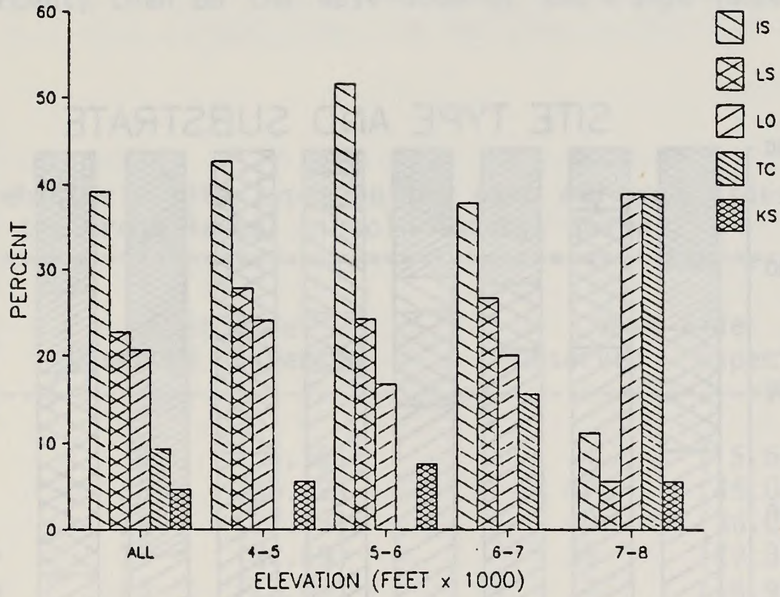


Figure 5-37: Prehistoric site types present in major elevation zones in the Groom Range, Lincoln County, Nevada. The first cluster of bars represents all site types found in the quadrat sample. Each cluster of bars contains only the site types shown in the key, this totaling slightly less than 100 percent of the sites in any given zone.

IS = Isolate
LS = Lithic Scatter
LO = Locality
TC = Temporary Camp
KS = Knapping Station

The distribution of sites which are almost entirely composed of debitage (isolates, localities, and lithic scatters) is quite similar. These site types occur throughout most landforms. Landforms lacking numbers of these sites represent small areas, with consequent smaller sample size. Temporary camps are closely associated with saddles, with 30.00 percent of the camps in a landform that occupies a very small percentage of the project area. Usable saddles are found most commonly in the central portion of the range, which is underlain by volcanics (Figure 2-9). The limestone ridges on the north and south ends of the Groom Range do not form good saddles and are used little. Fans, ridges, and valleys are also selected for locations of temporary camps. Quarries in the Groom Range are dependent on bedrock exposures and are thus associated with upland landforms.

Substrate

Over half (52 percent) of the sites in the Groom Range occur on alluvium (Figure 5-38), but other substrates except eolian, are also well represented. The low frequency of sites on eolian substrates is probably due to the tendency for eolian deposits to be a secondary component of another substrate, usually being thinly deposited on colluvium or residium, or mixed with alluvium. Nevertheless, eolian substrates are extremely important, providing the fine particles necessary for many of the plants necessary for aboriginal subsistence. The large expanse of eolian sand northeast of Groom Lake is an important area for primitive foragers in search of herbaceous plant resources.

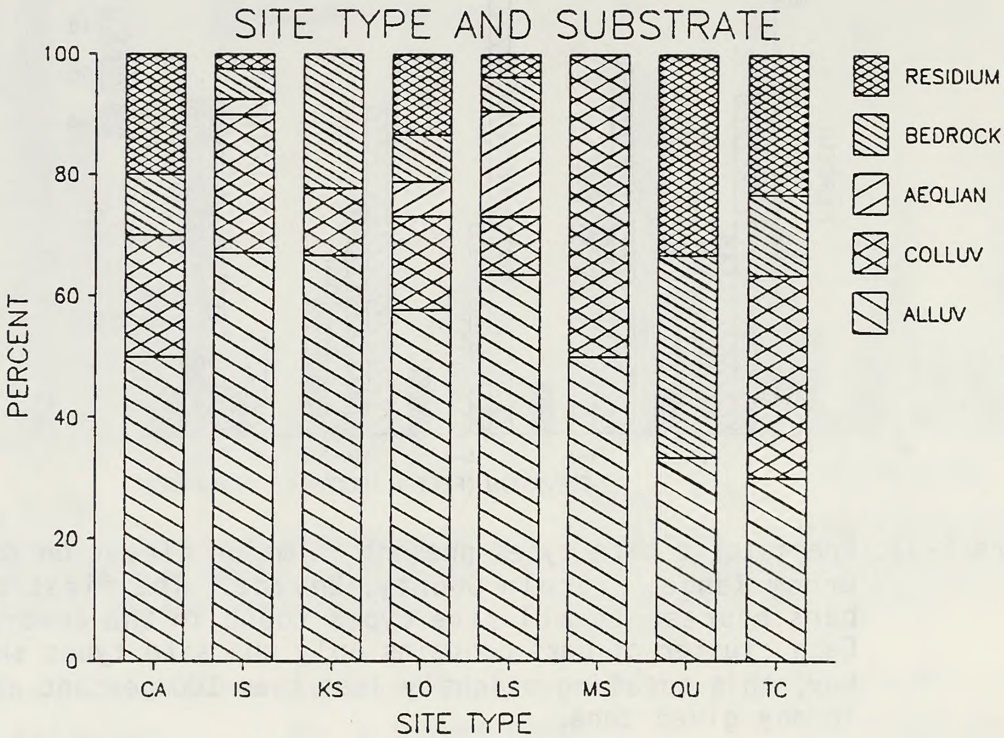


Figure 5-38: Site type and substrate in the Groom Range, Lincoln County, Nevada.

External Influences

Given the large areas utilized by aboriginal populations in search of the scattered resources needed for their survival, it is certain that the Groom Range was not a self-contained settlement or subsistence unit. An examination of the surrounding areas shows that the Pahranagat Valley is the closest place where a large aboriginal population could have been based. The projected site density map for the Groom Range (Figure 5-24) does not show that the east side of the range was used more than the west side, but other differences do occur. The most obvious is in the distribution of rock features which we interpret to be pinyon caches. Nearly all occur on the east side of the range. Projectile points and pottery also cluster in the northeast portion of the study area. The crest of the Groom Range presents a formidable barrier to travel from east to west. To test the distinctiveness of the two sides of the Groom Range, a x^2 test was used to compare site types occurring on each side of the range. Milling and knapping stations were lumped with localities and quarries were dropped from the analysis to eliminate cells with low values (Table 5-15). The Pearson chi-square value is 18.09 with 4 degrees of freedom. There is only a .001 probability that this figure could result from a representative sample of the same population. Consequently the null hypothesis that both sides of the Groom Range are parts of the same population can be rejected. Differences between site types present in the two areas include greater proportions of lithic scatters and localities in the west side than the east side, and a much greater proportion of temporary camps on the east side (22.33 percent) than on the west side of the range (5.26 percent).

Table 5-15: Prehistoric site types on the east and west sides of the crest of the Groom Range, Lincoln County, Nevada.

Site Type	East Side Observed	East Side Expected	West Side Observed	West Side Expected
Cache	6	(4.36)	4	(5.64)
Isolate	33	(34.92)	47	(45.08)
Locality*	24	(27.93)	40	(36.07)
Lithic Scatter	17	(22.69)	35	(29.31)
Temporary Camp	23	(13.09)	7	(16.91)
Total	103	(102.99)	133	(133.01)

* Includes knapping and milling stations.

Ethnohistoric Sites

Aboriginal sites that can confidently placed after Euro-american contact are rare. But, this may not be due simply to a scarcity of the sites, as their recent age insures that a large relative proportion of these sites are preserved. Archaeological identification of ethnohistoric sites depends on the convincing association of aboriginal remains with materials derived from the Euro-american culture. Extensively used residential sites, which are the places where the highest amount and variety of artifact deposition is expected, are not generally places where such association can be demonstrated without extreme care in mapping which is beyond the scope of normal archaeological survey. These same spots have generally seen ongoing usage from prehistoric times, through the period of contact, and continuing to the present. Thus unrelated aboriginal and Euro-american artifacts are in immediate proximity to one-another on the ground surface. To further complicate matters, such residential areas are usually in the same places frequented by livestock, which stir the ground surface enough to obscure many concentrations of related artifacts, mixing them with nearby unrelated artifacts. Most of the larger spring sites in the Groom Range contain both abundant types of prehistoric artifacts and historic remains, chiefly cans, which may be old enough to represent post-contact aboriginals. But we do not have enough evidence to determine whether the old Euro-american artifacts were used by Euro-american or aboriginals in the Groom Range. The few sites we have identified as ethnohistoric are thus relatively small in terms of artifact yield and possess both historic and prehistoric artifacts or feature types, without the overlap problems of intensively used sites.

Hooter Holler

Several sites make up the complex in Hooter Holler, which is a relatively flat bottomed east facing valley on the slopes of Mount Baldy at an elevation of 7200-8000 feet. Sites 26Ln3114, 3115, and 3116 are rock circles in a narrow arm of a valley 100 m uphill of site 26Ln3121, which is the main site in the complex (Figure 5-39). A small temporary camp (26Ln3120) occupies a saddle northeast of 26Ln3121, and a small site (26Ln3119) with a rock circle and two bedrock caches is in the valley bottom about 100 m southeast of 26Ln3121. The caches in Hooter Holler are discussed in the section on rock features.

Sub-division 1 of site 26Ln3121 contains the remains of an aboriginal structure consisting of four large pinyon logs that have collapsed into a semi-circular cleared area at the base of a rock outcrop (Figure 5-40). The logs have fallen in such a was as to suggest a structure leaning against the outcrop. The ends of the logs are too decayed to tell if the ends were cut with an iron axe, though the presence of wood in the open suggests a relatively recent date for the feature. Associated artifacts include two millingstones and two obsidian biface thinning flakes.

Artifact density on the floor of Hooter Holler is remarkably low. A small isolated activity area (Sub-division 2) contains two flakes, a millingstone, and significantly, a single lap seam resealable can. An isolated flake and a Stage III obsidian biface at a rock ring (Feature 9) comprise the only other prehistoric artifacts found in the area. Other historic artifacts in Hooter Holler include a heavily worn horseshoe in a rock circle (Feature 4) and a hand soldered single lap seam food can. The can was modified by cutting off the top and punching holes in the sides. Finally, an axe was cached in a crevice of a large rock outcrop at Site 26Ln3119.

The mix of historic artifacts and prehistoric artifacts and features in Hooter Holler is excellent evidence for ethnohistoric use of the area. This use, most likely, was oriented around the collection of pine nuts in the dense pinyon forest blanketing the floor of the Hooter Holler. The lack of artifacts at Hooter Holler, however, argues against any long-term occupation. It seems clear that the area was visited only long enough to collect nuts, and those which could not be carried out were cached. Those cached stores, then, could be exploited by peoples occupying temporary camps at Quail Spring (26Ln3123 and 3124), situated 2 km down valley from Hooter Holler, as well as at sites like 26Ln3120 located on the higher but warmer saddles and ridges around Hooter Holler.

Sites 26Ln3312 and 26Ln3313

A distribution of sites similar to that found in Hooter Holler also occurs in a west-facing valley on the northwestern side of the Groom Range (Figure 5-1). Here a rock ring and two depressions (26Ln3313) in an alluvial debris flow are likewise interpreted to represent pinyon caches. The only artifact found on the floor of this pinyon-juniper covered valley was a horseshoe near site 26Ln3313. Although it is possible that this artifact may not be directly associated with the caches, it's isolated occurrence in this area is suggestive of an association.

The Condos

Although the Condos (Site 26Ln3097) already have been described in detail in the section on rockshelters, they are again included here because of the likelihood they were last occupied by historic aborigines. Since this site is on a main route of travel over the Groom Range via Hamel Valley and Naquinta Pass, it is not surprising that this shelter complex appears to exhibit considerable re-use by aboriginals. It contains three notable historic artifacts. A Starr carbine, which apparently has been bent during use as a lever, was found along the edge of a wash immediately below the shelters (Figure 4-11a). A domestic cow (Bos taurus) horn was found lodged in a crack in the wall 1.5 meters above floor level of a rockshelter at The Condos. Finally, a tin flask (Figure 4.10d) was recovered from within a circular rock alignment in front of another rockshelter.

Site 26Ln3088

This temporary camp includes a hearth, four pieces of ground stone, and a core. A board (milled lumber) with a carved knob and hole in one end was found lodged in a crack in the rocks (Figure 4.10a). This re-used board was formerly attached to some kind of larger structure with five clenched square nails. It is possible that this artifact, although quite large, represents an aboriginal bull roar used during religious ceremonies.

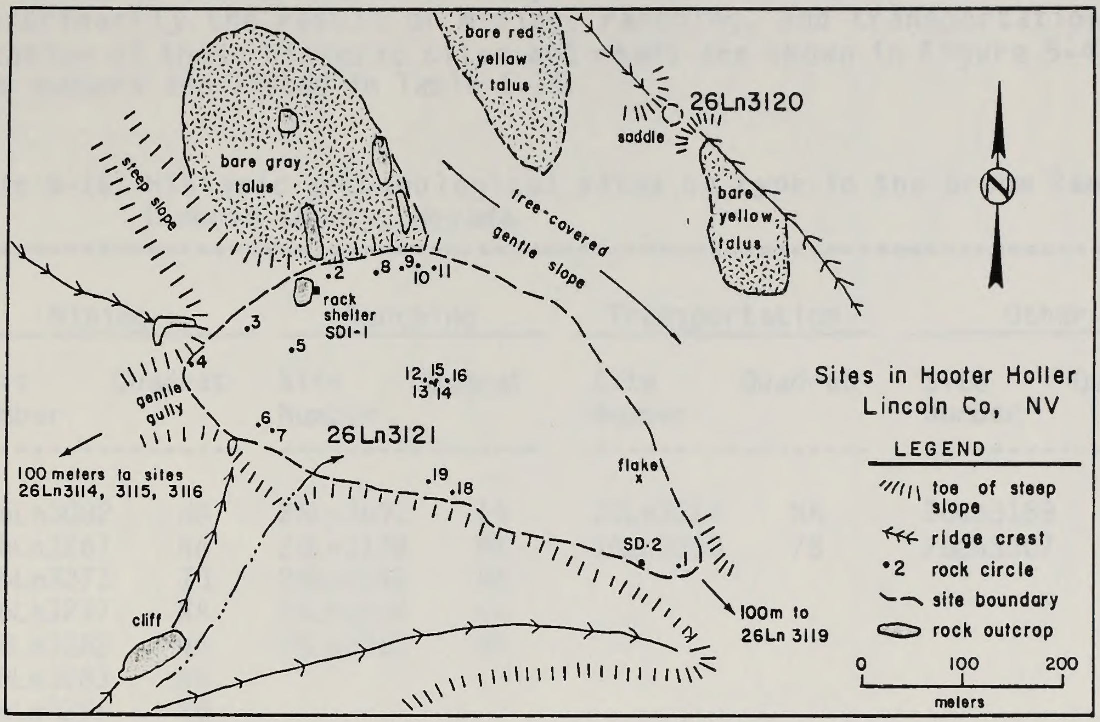


Figure 5-39: Sites in Hooter Holler, Lincoln county, Nevada.

Figure 5-40: Historic aboriginal structure at Hooter Holler (26Ln3121).

Historic Sites

Historic use of the Groom Range has been limited. Scattered remains are primarily the result of mining, ranching, and transportation. The location of these historic sites and roads are shown in Figure 5-41 and site numbers are listed in Table 5-16.

Table 5-16: Historic archaeological sites by type in the Groom Range, Lincoln County, Nevada.

Mining		Ranching		Transportation		Other	
Site Number	Quadrat	Site Number	Quadrat	Site Number	Quadrat	Site Number	Quadrat
26Ln3082	NA	26Ln3091	14	26Ln3218	NA	26Ln3169	48
26Ln3267	NA	26Ln3128	NA	26Ln3260	78	26Ln3307	24
26Ln3271	73	26Ln3142	NA				
26Ln3277	NA	26Ln3296	NA				
26Ln3282	NA	26Ln3330	NA				
26Ln3283	NA						
26Ln3286	59						

Mining

Groom Mine

As discussed above (page 62), the Groom Mine (26Ln3283) has been worked intermittently from the 1860's to the present. Many material remains representing much of this time span are preserved at the site due to the continued operation and protection of the property by the Sheahan family. Instead of the usual vandalism and removal of historic artifacts and features, the main impact on older remains has been salvage of materials for use in ongoing operations. Such impacts are minimal because of the small scale of recent operations. The Groom Mine and related facilities occupies a 1500 x 600 m area in a small south facing valley in the southern end of the Groom Range (Figure 5-42). Prospects, claim markers, roads, and artifact concentrations occur throughout this area, but the main mining (Div. 1 & 3), milling (Div. 2), and residential areas (Div. 4) are segregated from one another. Much of the detailed information in this summary was provided by Dan and Pat Sheahan.

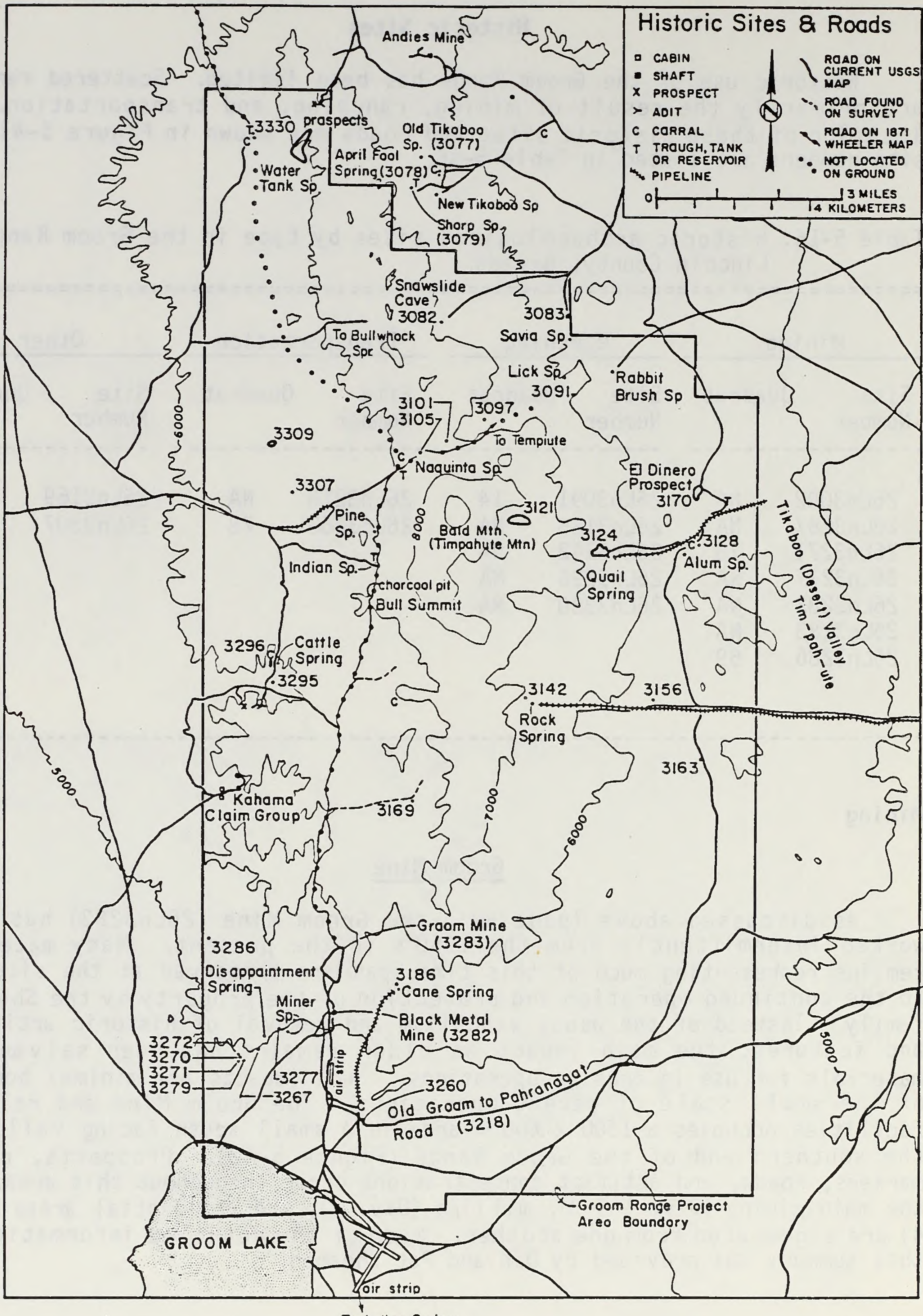


Figure 5-41: Historic sites and roads in the Groom Range, Lincoln County, Nevada.

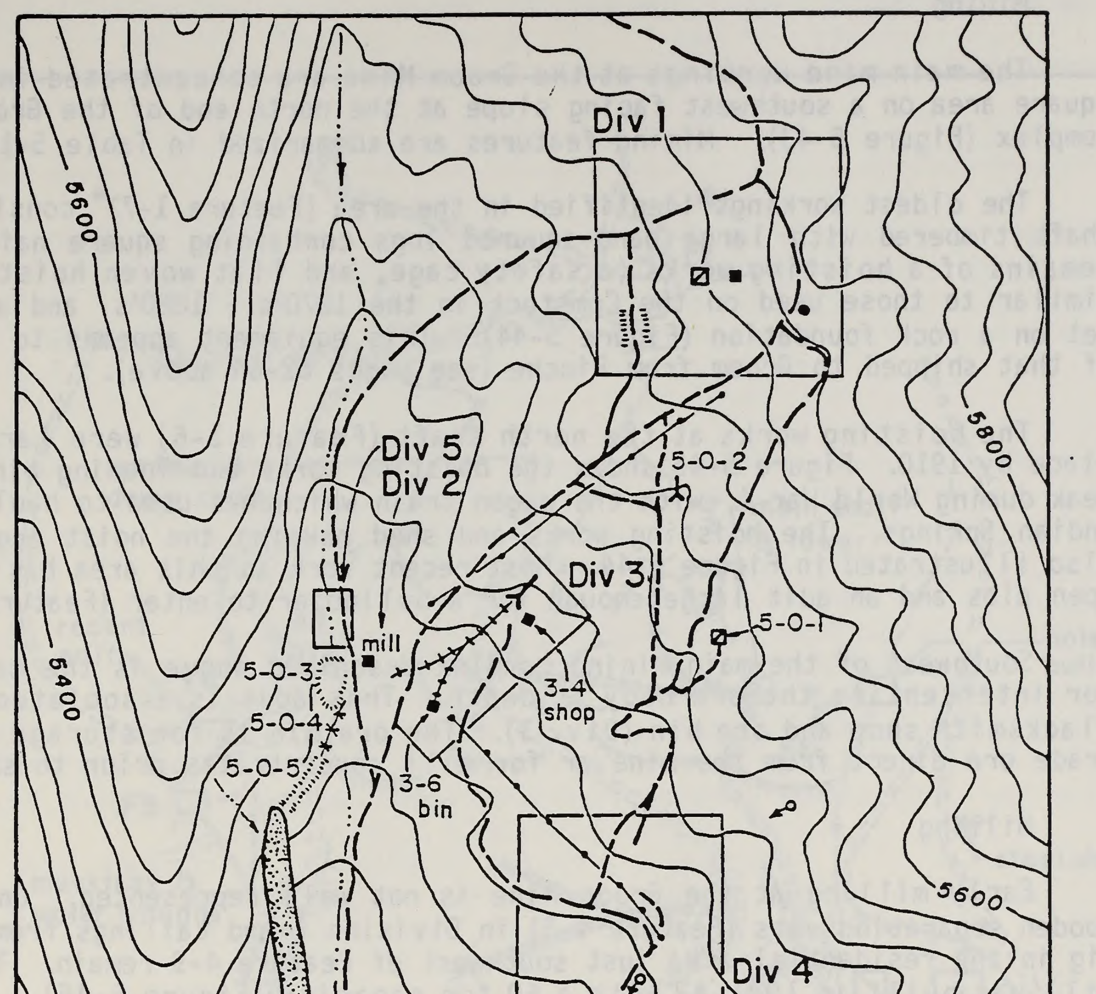


Figure 5-42: Map of the Groom Mine (26Ln3283), Lincoln County, Nevada.

Mining

The main mine workings at the Groom Mine are concentrated in a 150 m square area on a southwest facing slope at the north end of the Groom Mine complex (Figure 5-43). Mining features are summarized in Table 5-17.

The oldest workings identified in the area (Feature 1-7)* consist of a shaft timbered with large hand-squared logs containing square nails, the remains of a hoisting works (a safety cage, and flat woven hoist cable) similar to those used on the Comstock in the 1870's - 1880's and a boiler set on a rock foundation (Figure 5-44). This equipment appears to be part of that shipped to Groom from Pioche (see pages 62-64 above).

The hoisting works at the north shaft (Feature 1-6) were largely in place by 1910. Figure 5-45 shows the hoisting works and loading bin at its peak during World War I, with the wagon train which was used to haul ore to Indian Springs. The hoisting works and shed housing the hoist engine are also illustrated in Figure 5-44. Most recent work in this area has been by open pits and an adit large enough for a bulldozer to enter (Feature 1-4).

Southwest of the main mining complex described above is the main adit for intercepting the ore body at depth. This adit is associated with a blacksmith shop and ore bin (Div. 3). The ore bin is for storage of high grade ore direct from the mine or for mill concentrates prior to shipping.

Milling

Early milling at the Groom Mine is not well represented. Only some wooden separating vats (Feature 1-3) in Division 1 and tailings from a hand jig in the residential area just southwest of Feature 4-9 remain. The main mill was built in 1941-42 with a 50 ton capacity (Figure 5-46). Ore was run through a grizzly to an 8 x 15 Pacific crusher (Feature 2-3), up a conveyer belt into a storage tank (Feature 2-5), fed into a 5 x 4 ball mill, and to Denver Sub A flotation cells. Coarse ore was then sent to a rake type classifier; fine ore went into a concentrating table. The final step was from a Denver 6 cell unit to a concentrating table. The mill was upgraded in 1946-47 to 150 ton capacity with the addition of a Century jig, flotation, and table concentrates (Figure 5-47). The mill was destroyed by an explosion in 1954, and most of the building materials have been salvaged, leaving the burned and twisted machinery in place (Figure 5-48).

Power for the facility was provided by a diesel engine (Feature 2-8), with a generator, and an air compressor. A workshop area (Feature 6) with a drill press, gas and arc welding equipment, a scale, a vise, and assorted tools occupies nearly half of level 3. Water was recycled using a large wooden vat (Feature 2-11) and the waste slurry sent via a raised aqueduct (Feature 5-4) and ditch (Feature 5-5) to a tailings pond (Figure 5-47). Coarse tailings were sent by conveyer belt to a pile (Feature 5-3) near the base of the mill (Figure 5-47). The concrete-covered grave of Dan Cosis, a laborer who fell to his death in a shaft in 1917, is located near the tailings pile.

*The first part of the feature number refers to the Division; the second part refers to the sequential feature number within the Division.

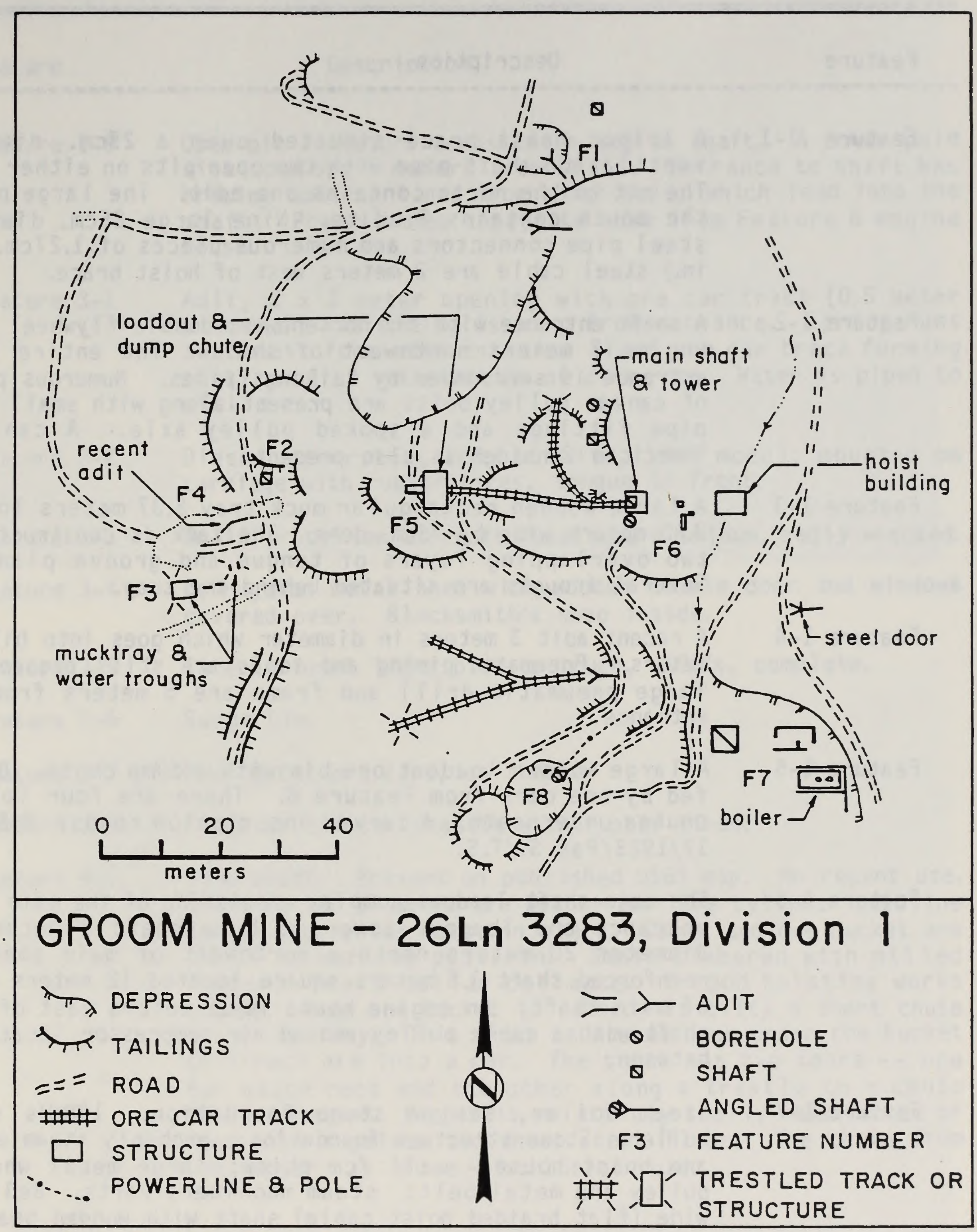


Figure 5-43: The primary mine complex at the Groom Mine, Lincoln County, Nevada.

Table 5-17: Mining features at the Groom Mine (26Ln3283), Lincoln County, Nevada.

Feature	Description
Feature 1-1	A tripod hoist brace situated over a 25cm. diameter ventilation shaft pipe with two open pits on either side. The pit to the north contains one adit. The large pit to the south contains 2 adits. Nine large 25cm. diameter steel pipe connectors and numerous pieces of 1.27cm. (1/2 in.) steel cable are 2 meters west of hoist brace.
Feature 1-2	A shaft entrance with six horsepower, double flywheel hoist engine 2 meters northwest of shaft. The entire shaft entrance is surrounded by tailings piles. Numerous pieces of canvas pulley belts are present along with small steam pipe fittings and a spoked pulley axle. A can with "American Carbide" is also present.
Feature 1-3	A large wooden rectangular muck tray 5.37 meters long by 3.80 meters wide by 75cm. deep. The tank is constructed of two overlapping layers of tongue and groove planking. Several troughs are situated behind the tray.
Feature 1-4	A recent adit 3 meters in diameter which goes into hill 10 meters. Pneumatic piping and tools are still present. A large pneumatic drill and frame are 5 meters from the entrance.
Feature 1-5	A large wooden loadout ore bin with a dump chute. Bin is fed by ore cars from Feature 6. There are four loadout chutes underneath. A carved inscription reads: B.S./Dec 17/1923/Pat S./T.S.
Feature 1-6	The main shaft loadout complex consisting of the main shaft entrance and loadout tower, a bare shaft 2 meters in diameter 20 meters north x northwest of main shaft, a reinforced shaft 1.5 meters square located 12 meters north of main shaft. An engine house is 12 meters east of main shaft with a cable pulley and an air compressor located in between.
Feature 1-7	Steam boiler, set on stone foundation. 1880's style boiler. Stone structure foundation: probably steam engine and hoist house - wall 7cm thick; large metal wheels, pulley and metal belt: steam machinery parts. Belt 7cm wide (flat braided hoist cable) shaft with wooden beams at top, hand hewn with square nails. Adit; metal door locking entrance.

Table 5-17: Mining features at the Groom Mine (26Ln3283), Lincoln County, Nevada. (cont'd)

Feature	Description
Feature 1-8	Open pit 14 meters across with angled shaft. A power pole sits upslope 5 meters from shaft. Entrance to shaft has bracing holding lines from power pole, which lead into the shaft. Power lines appear to come from Feature 6 engine house.
Feature 3-1	Adit, 2 x 2 meter opening with ore car track (0.5 meter diameter) and spring issuing from entrance. Spring runs southeast from adit entrance along ore car track forming small pond at intersection of dirt road. Water is piped to mill area.
Feature 3-2	Diesel generator, army surplus, 1949 model, mounted on carriage with rubber tires, tongue in front.
Feature 3-3	Small propeller aircraft fuselage, aluminum, badly wrecked.
Feature 3-4	Corrugated metal shed with wooden double door and windows covered over. Blacksmith's shop inside.
Feature 3-5	International light pick-up truck, 1930's, complete.
Feature 3-6	Surge bin.
Feature 3-7	Four metal ore cars, on track.
Feature 3-8	Truck or trailer chassis with rubber tires.
Feature 5-1	Mine shaft. Present on published USGS map. No recent use. Round nails. Timbers are weathered. One cylinder gasoline donkey engine for hoist in place. Cable and ore bucket are still in working position. Shaft timbered with milled lumber. Small collar collapse. Tripod hoisting works intact. When ore bucket is raised, it tilts a short chute out of the way. This chute is pushed back under the bucket to direct ore into a car. The track has two spurs -- one for waste rock and the other along a trestle to a chute above a hopper. Hopper is relatively small, constructed of wood with a galvanized sheet steel floor. The chute from the hopper is above a bulldozed road.

Table 5-17: Mining features at the Groom Mine (26Ln3283), Lincoln County, Nevada. (cont'd)

Feature	Description
Feature 5-2	Adit. Extensive dump. Adit is oriented to intercept the main Groom Mine shaft complex (Division 1). Ore car track and an air or water pipe are intact. Partial cave-in near entrance. Much cool air blowing out of adit. a 1960's vintage International 2 wheel drive crew cab short bed pick-up truck is on blocks near the entrance. Other debris at the entrance on the leveled top of the jump includes large timber, empty carbide canisters, double seamed cans, and a pile of scrap metal.

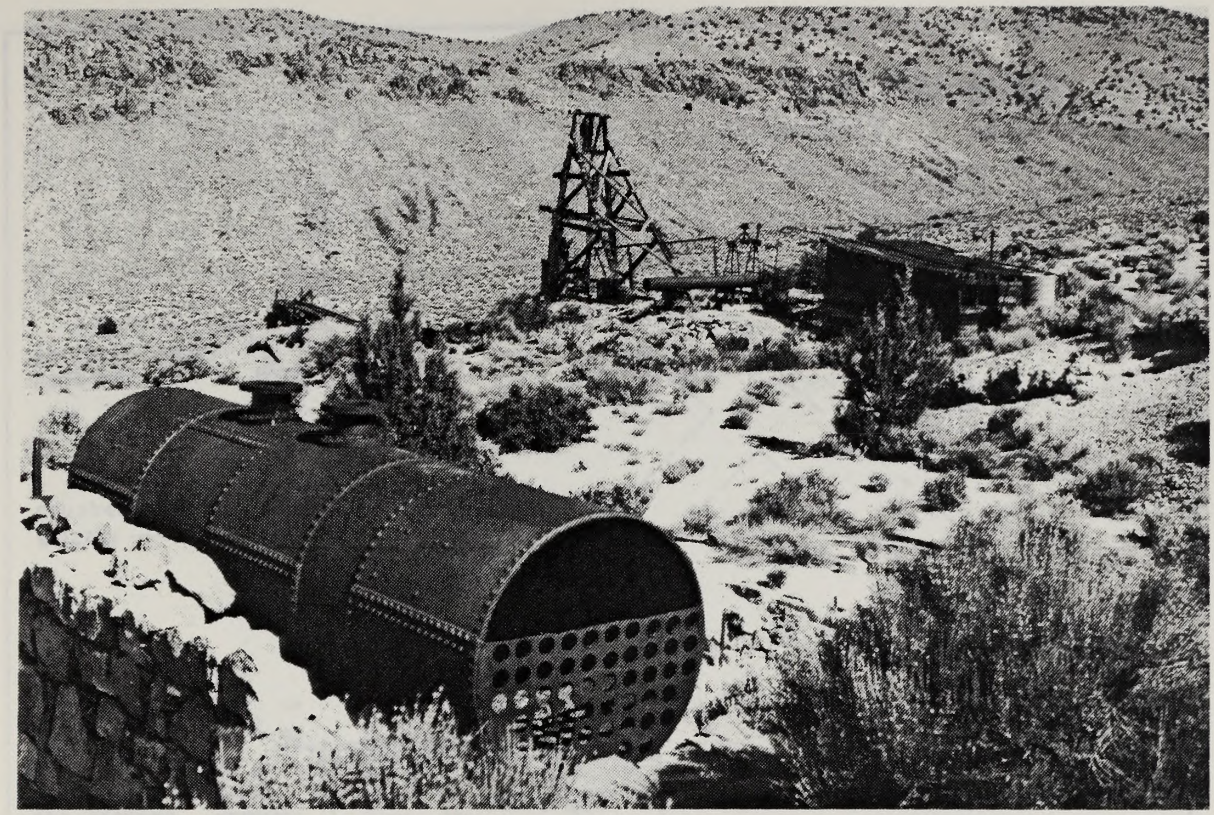


Figure 5-44: Old mine workings at Groom Mine (Features 1-7) in foreground; north shaft (Features 1-6) in background.

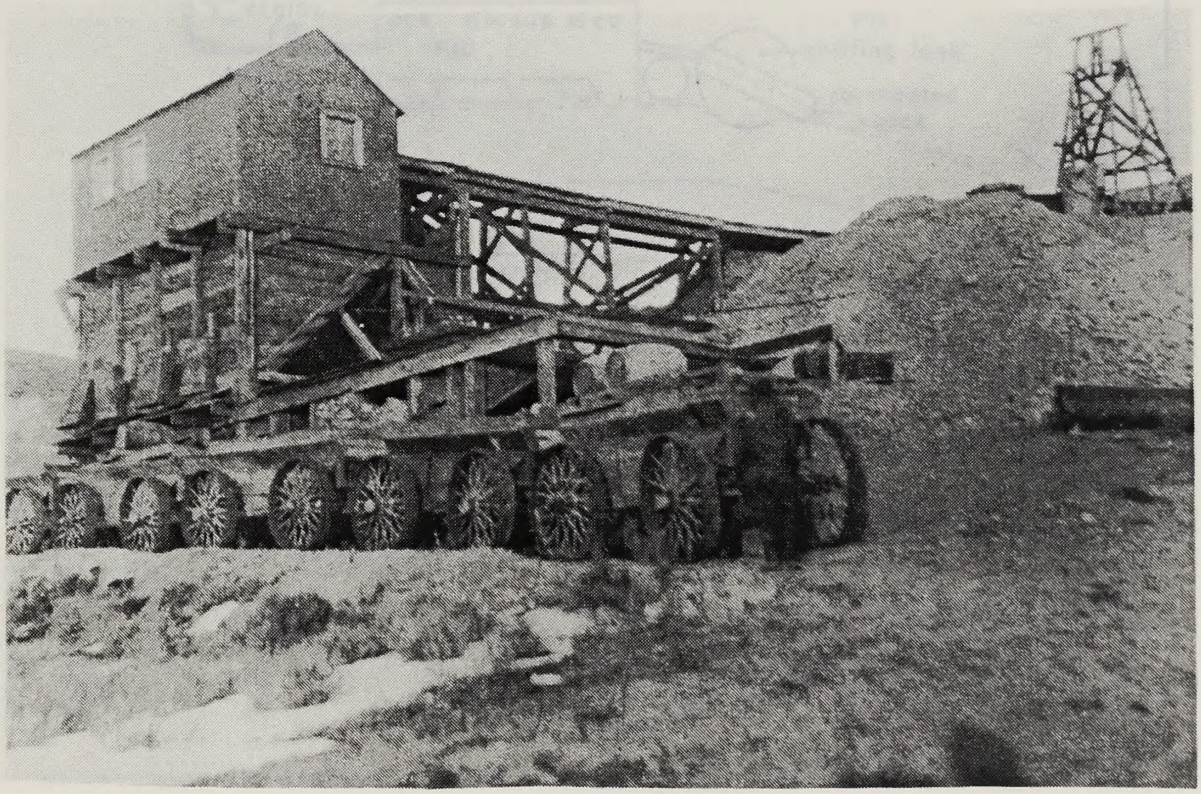


Figure 5-45: Groom Mine ca. World War I with wagons used to haul ore to Indian Springs (Features 1-5 and 1-6). Photo courtesy of the Sheahans.

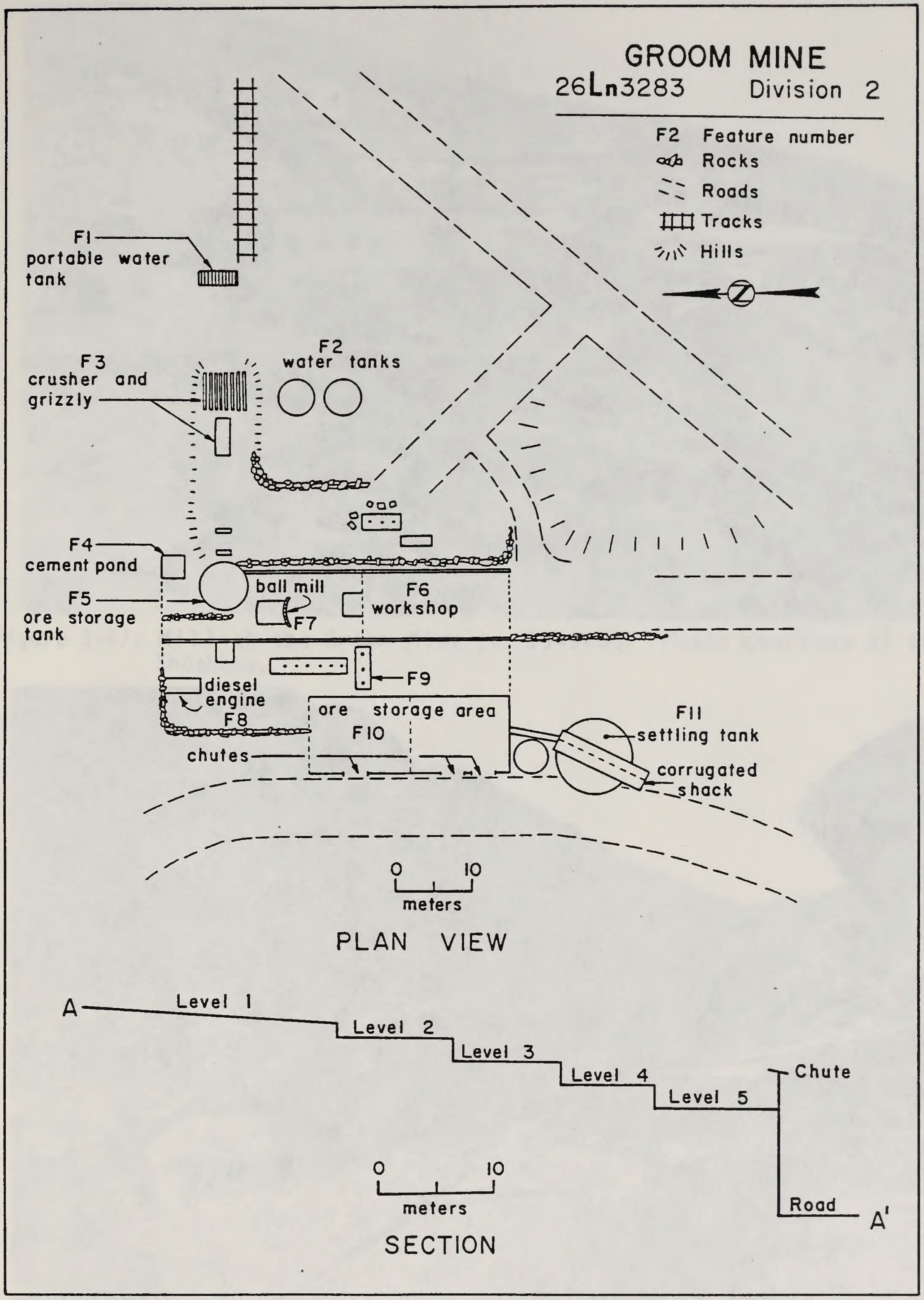


Figure 5-46: Mill plan and section at the Groom Mine, Lincoln County, Nevada.

Figure 5-47: Mill at the Groom Mine ca. 1949-50. Photo courtesy of the Sheahans.

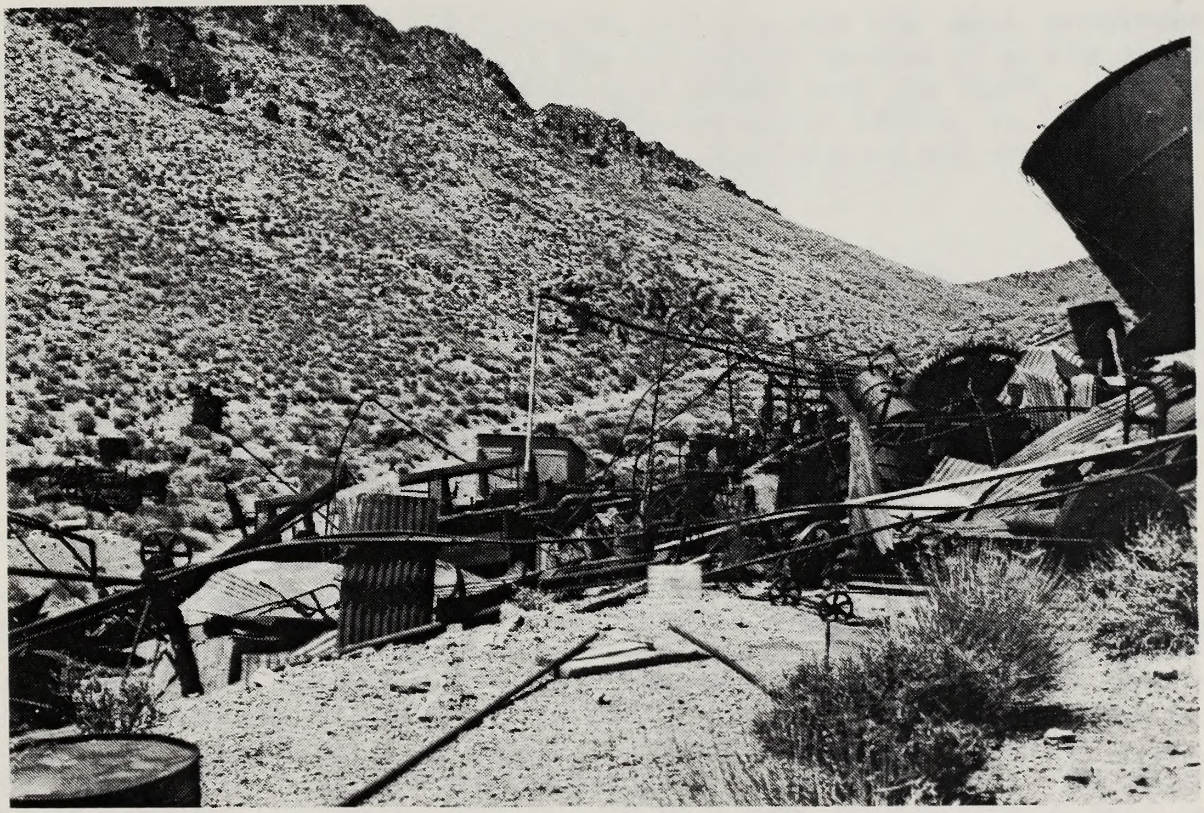


Figure 5-48: Mill at the Groom Mine. The photo is taken from the south side of level 3. Shop area is in foreground. Large cogged wheel is on the ball mill.

Residential Area

Most residential structures at the Groom Mine are located in a 2300 x 150 m area southeast of the mill (Figure 5-49). The earliest structures, comprising the townsite of Naquinta, are scattered along the base of a west facing slope in the southeast edge of this residential area. These features include a dry-lain rock foundation situated in the side of a gully (Feature 4-17), a dugout and two large rock cabins which appear to be re-roofed and other wood parts (Feature 4-26; Figure 5-50) ruins of a stone cabin and two tent platforms located south of the area shown in Figure 5-51 (Feature 4-30; Figure 5-49 and several trash scatters with hole-in-cap cans and purple bottle fragments. Portions of most existing buildings at the Groom Mine were in existence by the start of the World War I. Figures 5-52 and 5-53 illustrate the evolution of some of these buildings. A view of "main street" in 1913 shows the office (Feature 4-13) lacking a second story and the small cabins to the east with canvas wall. A contemporary photo shows the addition of a second story to the office, today now used as a residence, and the addition of wooden walls to the row of cabins. Table 5-18 summarizes the features present in the residential area.

The remaining concentration of features is in the "boneyard" (Subdivision 5-1) near the mill. Numerous tools, materials, and pieces of equipment are stored in this area. The larger features are summarized in Table 5-19.

Black Metal Mine

A 110 foot incline and a modern ore bin are the most prominent features at this site (26Ln3282). The collapsed remains of an old plank building constructed with round nails also occurs near the shaft. Another wood cabin, used by Ed Lane in the 1940's and early 1950's, is located .4 km north of the shaft. This cabin is plotted on the U.S.G.S. map.

Kahama Claim Group

A small residential area is at the mouth of the small canyon below the shafts mining area. Remains include two collapsed plank cabins, several terraces cut into the hillside, a well preserved root cellar (Figure 5-54) a wagon bed, and the grave of Charles P. Hanus. This site was not formally recorded during the survey nor assigned a site number as it was outside the sample area.

Cattle Spring

The prospects near Cattle Spring were also outside of the six percent random sample. Two distinct residential areas were recorded in this area. Site 26Ln3295 contains an historic component consisting of a rock alignment and leveled area forming a structure platform, with cans and other debris concentrated along the outside perimeter of the platform. Artifacts, including a mixture of hole-in-cap and double seamed cans, purple glass, and round nails, indicate a date between about 1900 and 1920. The other residential area (26Ln3296) has been used as a base for ranching as well as mining. The older components of this site include a wood cabin (Figure 5-55) a stone cabin in poor condition, a privy, and a similar mix of artifacts as that found at 26Ln3295 (Figure 5-54).

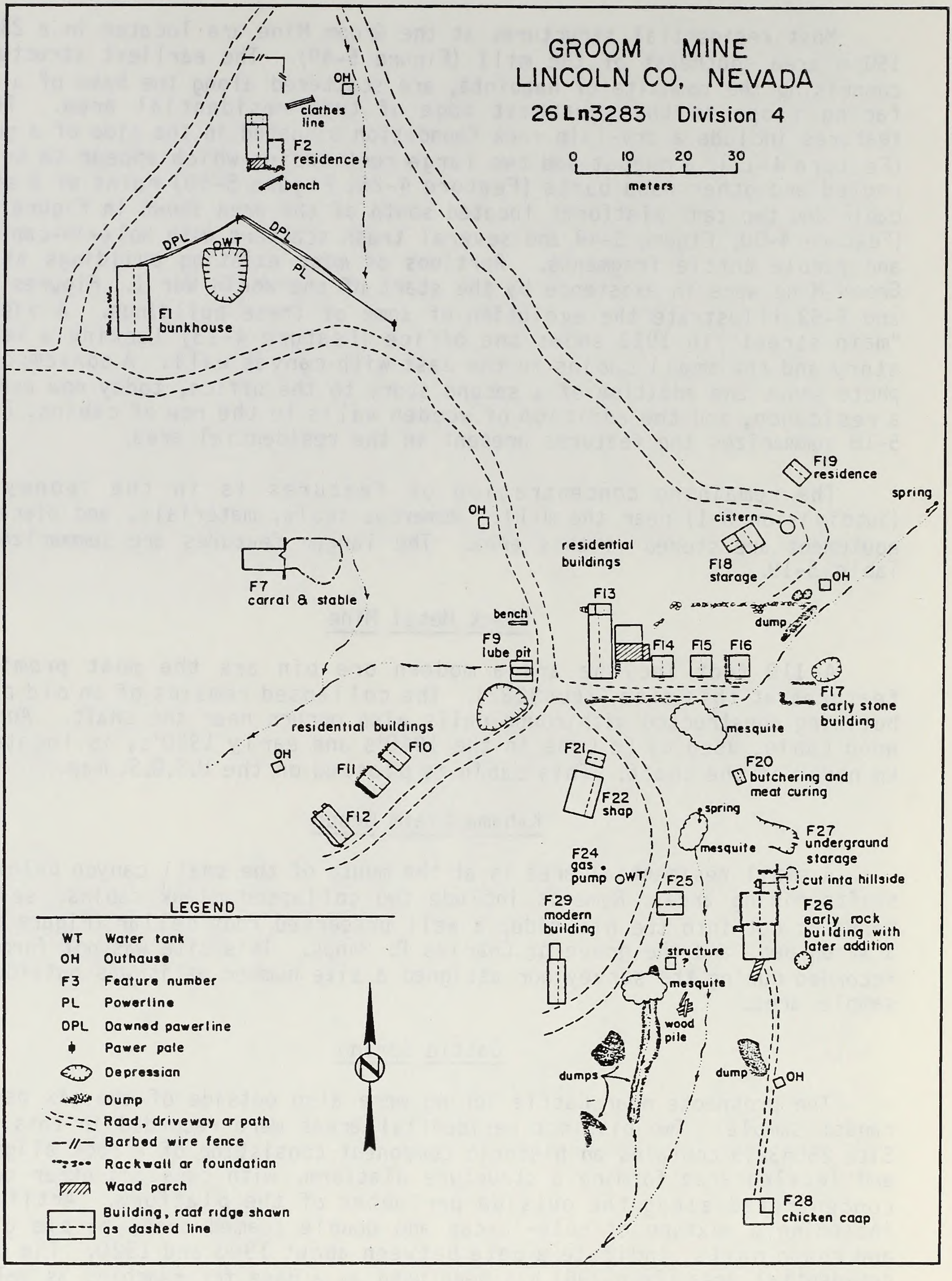


Figure 5-49: Residential area at the Groom Mine, Lincoln County, Nevada.

Figure 5-50: Stone cabin at the Groom Mine, Lincoln County, Nevada.

Figure 5-51: Stone walls at the Groom Mine, Lincoln County, Nevada.

Figure 5-52: Groom Camp in 1913. The dark building near the left side of photo is Feature 13. Photo courtesy of the Sheahans.

Figure 5-53: Residential area at the Groom Mine, Lincoln County, Nevada.

Table 5-18: Summary of features at the Residential area, Groom Mine, Lincoln County, Nevada.

Feature	Description
Feature 4-1	This building appears to be a bunkhouse. Constructed of corrugated steel sheets approximately 3 x 1 meters that are overlapping and nailed together. The window and door frames are wooden, apparently once painted white. The windows are intact except for 6 panes; only one has screening on the outside. The metal roof and sides are quite rusted as evidenced by the line of discolored pebbles under the eaves. Inside are the remains of 8 small rooms partitioned with plaster board. There are electric lights hanging from the ceiling. During what appears to be the last usage of this building in 1950-52 (based on newspapers inside), three of the southern end rooms were joined.
Feature 4-2	This structure has wooden sides with a corrugated steel roof. It appears to have been a residence with a wood stove in the front room and wood cooking stove in the back room. The back room appears to be a later addition. The porch out front has a rock foundation and there seems to be a rock garden on the east side. The fenced in back yard and clothesline add to the domestic character of this building. The outhouse is situated nearby on a slope in a seasonal drainage. There once was an outdoor light above the front door and apparently the windows were screened in (one remains, one on the ground).
Feature 4-3	An international, full ton, flat-bed truck. Year unknown but probably mid sixties.
Feature 4-5	An international, full ton truck with dump bed. Circa mid 1950's.
Feature 4-5	1950 Ford pick-up truck.
Feature 4-6	Ford roadster car.
Feature 4-7	Corral with small stable. Corral made from mining timbers and ore car track rails.
Feature 4-8	Road grader, not self propelled, designed to be towed. "Adams Leaning Wheel Grader No. 8 MFD. by J.D. Adams & Co. Indianapolis, IND. USA. Serial No. 3562."
Feature 4-9	Lube pit. Wood construction.

Table 5-18: Summary of features at the Residential area, Groom Mine, Lincoln County, Nevada. (cont'd)

Feature	Description
Feature 4-10	Shack. Wood construction. Tongue and groove siding which was covered with tar paper roofing was done with sheets of asphalt roofing. Currently used for storage. Very similar to other shacks in locality that appear to have been used as residence. There is a stove pipe through the roof. Wires and a fuse box suggest it had electricity.
Feature 4-11	Very similar to feature 10, except that building has a corrugated metal roof.
Feature 4-12	More modern building than features 10 and 11. Recently whitewashed. Inside is furnished with 2 modern bunk beds and one other larger bed in one room. The other room is a kitchen with table and modern canned goods on the shelves.
Feature 4-13	This is the only two story structure in this division. According to Sheahan's, this is a pre-World War II structure, as are features 14-16 and possibly 10 and 11.
Feature 4-14	Small residence, measures 4.4m x 3.75m. One room, corrugated metal roof, several beds.
Feature 4-15	Same as 14.
Feature 4-16	Same as 14 only more elaborate. Structure has shade over front door and trellis work around front window. Also pole that holds up the front porch roof.
Feature 4-17	Collapsed walls of a rock building. Sheahan's report it to be one of the earliest structures of the mine.
Feature 4-18	Remodeled older structure currently used for storage.
Feature 4-19	Similar to features 14-16. Has been reroofed with asphalt sheet.
Feature 4-20	Small building 2.6 x 2 meters. Has counter and rack for large (butcher) knives. Lower part of building is wood boards and upper part is screened. Many meat hooks on the rafters.
Feature 4-21	Small building with corrugated metal siding. Houses the electrical generator.
Feature 4-22	Large corrugated metal shop or storage building. Has generator in wooden room that has been added on.

Table 5-18: Summary of features at the Residential area, Groom Mine, Lincoln County, Nevada. (cont'd)

Feature	Description
Feature 4-23	International truck, 1 ton, ca. 1940's, currently being used for hauling water.
Feature 4-24	Gasoline pump, mechanical, Wayne, model 83, serial no. C10814K6, Wayne Company, Pacific Coast Division, Los Angeles, USA.
Feature 4-25	Wash building. This building has a shower, two bassinets, two wash boards.
Feature 4-26	Rock building with addition. Rock building may date to ca. 1860's according to Sheahan's. Part of the rock structure is built into the hillside. Much of the rock walls have collapsed and most of the roof has collapsed. The addition, wooden frame with corrugated metal siding and roof, is in good condition.
Feature 4-27	Entrance to underground storage. Modern metal door with cinder block now around entrance along with some modern rock work.
Feature 4-28	Chicken coop. Fences in yard. Rabbit hutch in yard.
Feature 4-29	Modern building, still under construction, exterior finished.
Feature 4-30	This feature consists of five historic components along side an old road, i.e. same road that follows drainage below feature 28. There is a spring with well and pump equipment, an adit, a probable structure pad, a depression with associated rock foundation and portion of a rock wall, and a rock house in ruins with an associated trash scatter. There is a small mesquite in a nearby wash with trash scattered down the wash.

Table 5-19: Summary of features at the Storage yard, Groom Mine, Lincoln County, Nevada.

Feature	Description
Feature 5-1-1	Fairbanks-Morse steam engine. 2 cylinder. Stored on timbers--not mounted. Model 47A014. 150 H.P. 300 R.P.M.
Feature 5-1-2	Privy. Two hole, On skids. Over pit, ready for use. Constructed on half lapped wood siding, half corrugated, galvanized sheet metal.
Feature 5-1-3	Storage shed. All galvanized corrugated sheet metal. Full to tools and spare parts. A pile of spare parts and tools also located on east side of shed.
Feature 5-1-4	Denver 5 x 5 Conditioner. Ore is pumped into central shaft which turns then released into the outer chamber formed by a large wood cistern.
Feature 5-1-5	Wood cistern bound by iron rods 1.5m high, 1.1m deep.
Feature 5-1-6	Two wood trailer beds lacking running gear.
Feature 5-1-7	Steam powered Ingersoll-Rand air compressor.
Feature 5-1-8	Diesel engine on iron skid. Radiator embossed "BUDA". Skid is embossed "SULLIVAN".

Figure 5-54: Root cellar at the Kahama Claim Group.

Figure 5-55: Cabin at Cattle Spring.

Other Mining Remains

Claim markers, constructed of piles of stone, were abundant throughout the southwest quarter of the project area especially around the Groom Mine. These remains were marked on quadrat maps but were not otherwise formally recorded. A few prospects were also found during the reconnaissance of the Groom Range. An example, situated on the east side of the range, is the El Dinero Prospect (26Ln3170), which lends its name to the aboriginal quarry in the same outcrop. An abortive shaft under the prominent rock outcrop in Figure 5-4, several large stone claim markers (Figure 5-56), a carefully cached hand-crank windlass, and a campsite comprise the material remains of this prospect. The claim notice places the El Dinero claim in the Timpahute Mining District. It is dated April 30, 1938, and bears the names of G.W. Therrat [George W. Thiriot, a rancher in Pahranagat (Koyen 1967:8)], Mrs. J.C. Williamson, and Wesley Koyen, who was prominent in developing the tungsten mines at Timpahute.

The Groom Range also has a nitrate prospect at Snowslide Cave (26Ln3082). A claim notice in the cairn in front of the cave indicates that Martin M. Gibson located the claim on March 13, 1953. Evidence of the 1950's workings includes several shallow pits in the soft dirt of the chamber below the upper level (Figure 5-57), a plank boardwalk over boulders on the floor of the first chamber, and a carbide and water cache. Evidence of other visitors to the cave is present in the Surprise Room where initials, brands, and names have been inscribed on the walls with the soot from carbide lamps. Names include G. Davis and Fallini. The only dated inscription is "D. BLACK 41".

Ranching

Every spring in the Groom Range has been altered by Euroamericans to improve water flow by digging out the spring mouth, and often by adding pipelines and troughs or reservoirs. Some springs have also been fenced to keep out livestock. Pipelines carry or once carried, water from the mountain springs far into Emigrant and Tikaboo Valleys to provide water at corrals and troughs. Many springs also have a corral located in their vicinity. An example of a fully developed spring is Water Tank Spring (26Ln3330). The mouth of this spring has been excavated by bulldozer in a deep trench at least 100 feet long. A pipeline leads to a large metal water tank (Figure 5-58) and to a concrete trough within a corral. The corral is typical of those in the Groom Range (Figure 5-59). It is constructed of a palisade of locally available logs twined together with barbed wire. Although a loading chute was not present at Water Tank Spring, most other corrals found included a chute.

Transportation

The road system and its chronology in the Groom Range is illustrated in Figure 5-41. With the exception of a limited number of roads bladed by the U.S. Air Force in the southern end of the Groom Range, most of the road system in this area has been stable since the 1870's. Roads run to all major springs and to each mine, and connect these areas to important nodes (Wahmonie, Indian Springs, Pahranagat, and Tempiute) in the regional transportation network. An additional, more ephemeral road network is on the wooded western slopes of the Groom Range where logging activities have taken place in support of the various mining efforts in the area. The nineteenth century road system, as shown by Wheeler and the General Land Office surveys, emphasizes the links between the Groom District and Tempiute, with Pahranagat, and with Indian Springs. Early twentieth century additions to this network were roads to Tonopah and to Wahmonie.

Logging

The sawmill purportedly built in 1876 was not found during the survey. The only definite remains of logging recorded were a road system, a slightly used camp, and many cut branches and old tree stumps in the vicinity of site 26Ln3169. This area has been claimed to have been exploited for wood by the Sheahans. The pinyon and juniper present in this area is chiefly useful for firewood, but Pat Sheahan Sr. mentioned the logging of large trees, which would be fir or limber pine, by his family (Sheahan 1985). The Sheahans indicate that there is a charcoal burning pit between Bull Summit and Indian Spring. This feature was not relocated in the field.

Figure 5-56: Claim marker at the El Dinero prospect.

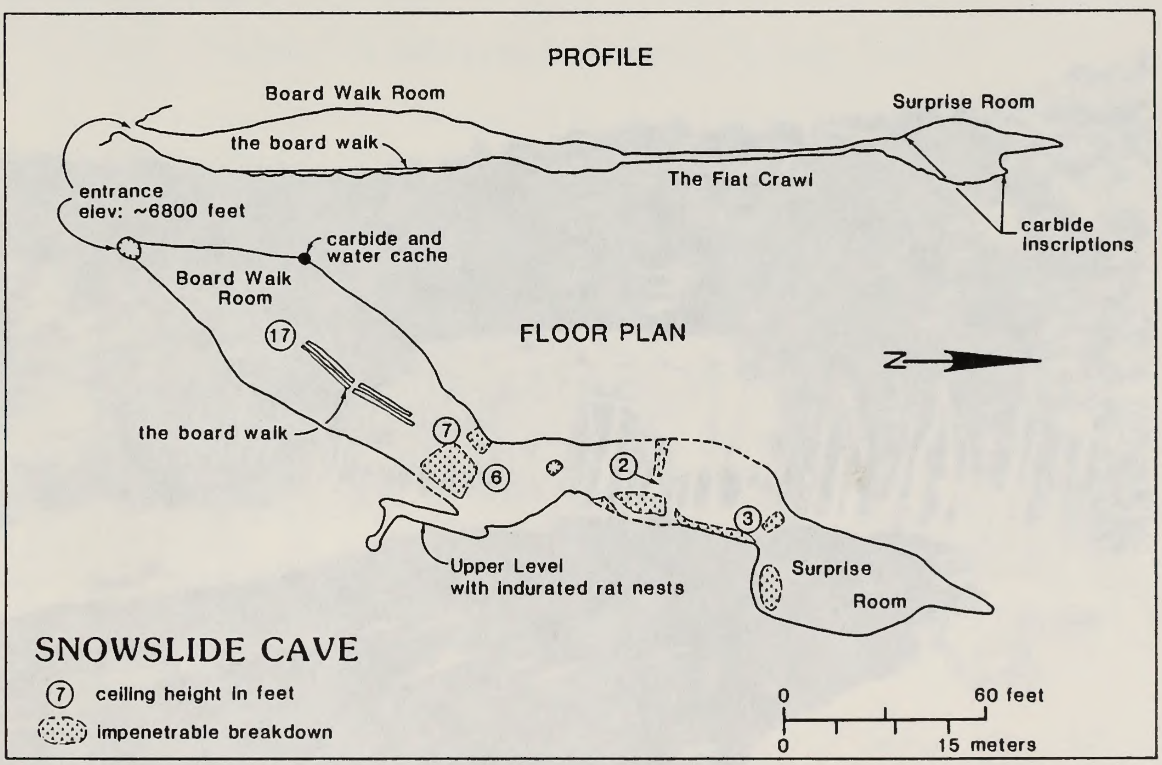


Figure 5-57: Map of Snowslide Cave, 26Ln3082, Lincoln County, Nevada.

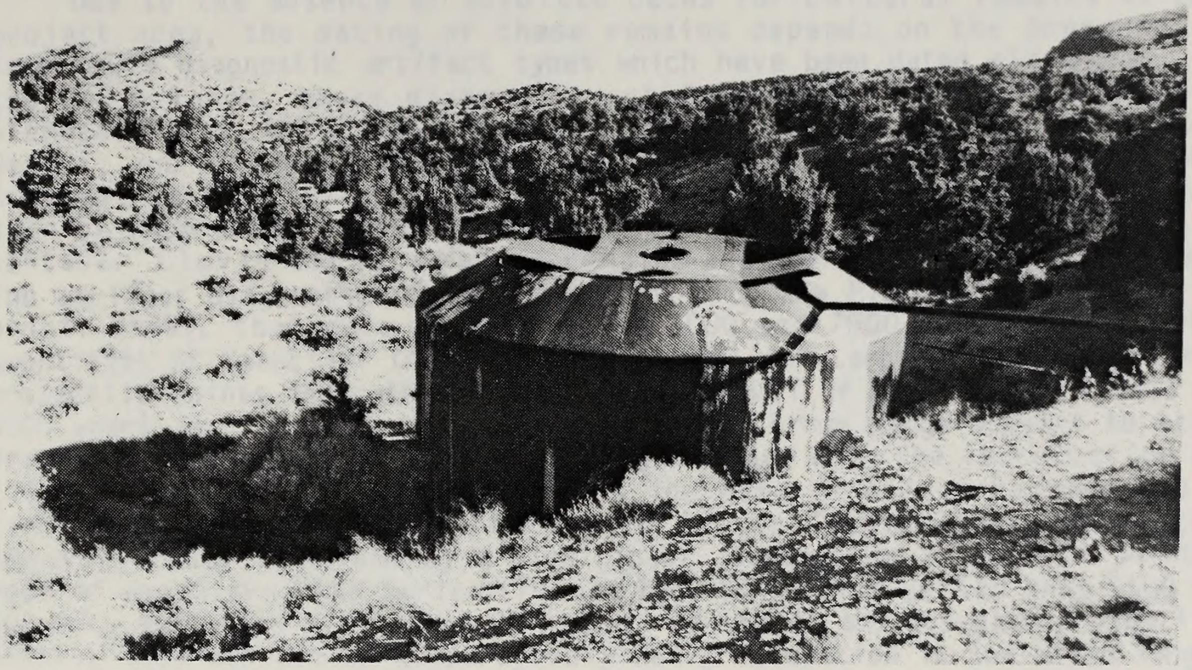


Figure 5-58: Tank at Water Tank Spring.

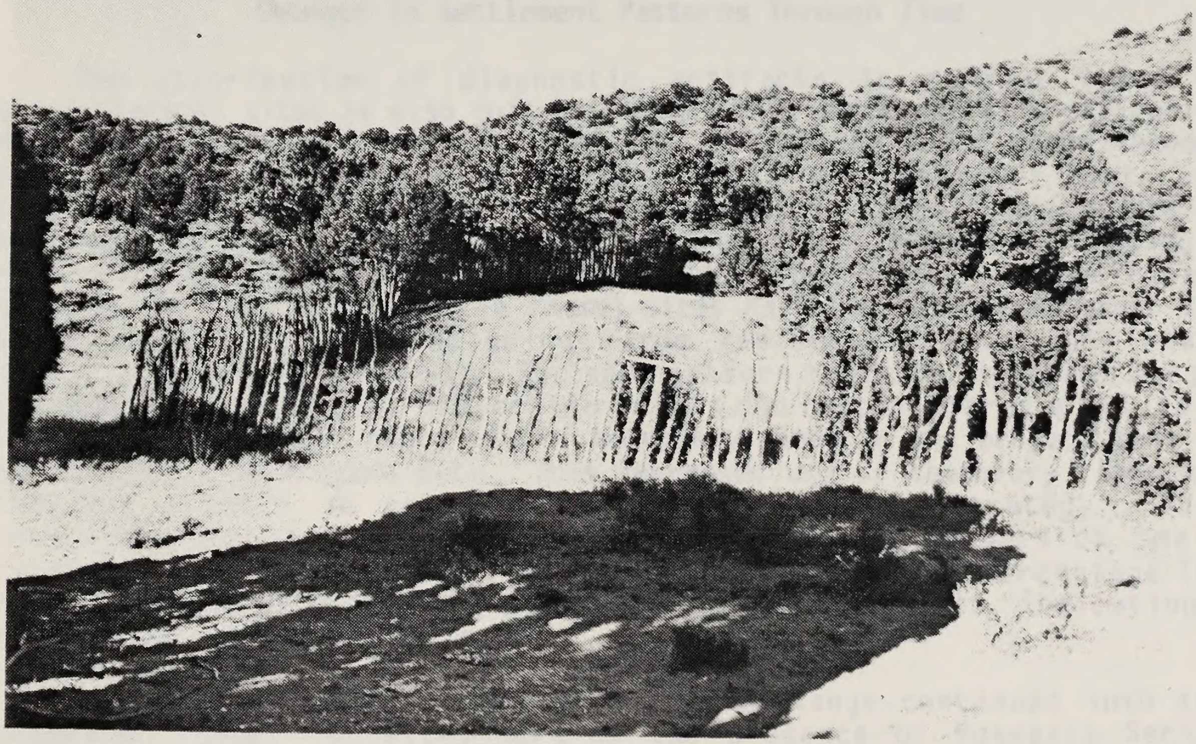


Figure 5-59: Corral at Water Tank Spring.

6. DISCUSSION

Chronology

Due to the absence of absolute dates for cultural remains in the project area, the dating of these remains depends on the presence of temporally diagnostic artifact types which have been dated elsewhere. In the Groom Range, these diagnostic artifact types include Great Basin Stemmed, Pinto, Gatecliff, Humboldt, Large Side Notch, Elko, Rosegate, Desert, and Cottonwood Series projectile point styles and Anasazi and Brownware pottery styles. These artifact types collectively cover a time span of from about twelve thousand years ago to the period of European contact. Clovis and Lake Mojave remains are scarce in the project area. The earliest diagnostics found in any quantity are Pinto style projectile points (n=9), that date between about 5000 and 7000 years ago. Small quantities of Gatecliff (n=5), Humboldt (n=5), and Large Side Notched (n=1) projectile points indicate a continuing low level of use from about 5000 to 4000 years ago. Prehistoric occupation in the Groom Range appears to have dramatically increased at about 4000 years ago with the introduction of Elko projectile points (n=17). This increase in use corresponds to a similar pattern at Gatecliff Shelter in the Toquima Range where the Reveille Phase is marked by a significant increase in projectile points, most of which are Elko Series (Thomas 1983:177). The period from 1500 to 900 B.P., marked by a total of 20 Anasazi potsherds and Rosegate projectile points, also was one of comparatively heavy occupation in the Groom Range. Evidence of use from 900 years ago to Euroamerican contact is also common, with 19 Brownware pottery concentrations and/or Desert or Cottonwood Series projectile points.

Changes in Settlement Patterns Through Time

The distribution of diagnostic artifacts in various types of archaeological sites is also quite diverse. This differential distribution indicates a possible change in aboriginal use of the Groom Range through time (Table 6-1, Figure 6-1). Only a small percentage of Pinto and Gatecliff projectile points were found in temporary camps. Most points of this style occur at lithic scatters and localities, perhaps reflecting a foraging pattern of resource exploitation (Binford 1980). A significant increase in Elko age (Reveille Phase) sites has been noted throughout the southern Great Basin, including large residential bases and house structures (see above p. 53). The same pattern holds in the Groom Range. If numbers of diagnostic projectile points can be considered a reliable indication, the first heavy use of temporary camps in the project area is during Elko time (Figure 6-1). This increased use of temporary camps may indicate a shift in resource use to a collection strategy. This interpretation is further strengthened by the low numbers of small locations and lithic scatters and the relatively high percentage (60 percent) of isolates which contain Elko projectile points, indicating a centralized collection strategy.

Relatively intensive use of the Groom Range continued into the Underdown Phase, indicated here by the presence of Rosegate Series projectile points. Use of temporary camps is still high, but a more even distribution of smaller sites and isolates is evident, perhaps indicating a more complete utilization of resources through space.

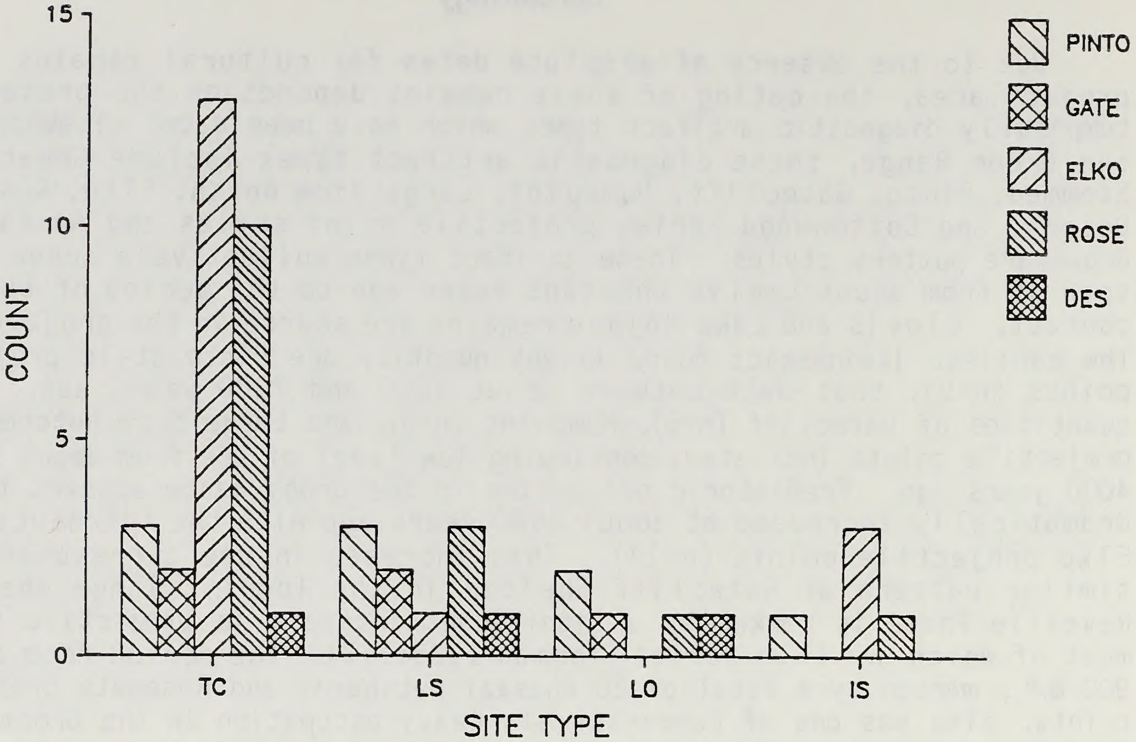


Figure 6-1: Projectile points at selected site types in the Groom Range, Lincoln County, Nevada.

TC - Temporary Camp LS - Lithic Scatter
LO - Locality IS - Isolate

Desert and Cottonwood series projectile points are rare in our sample. The utilization of the Groom Range during the last millennium or so is represented more fully by the common occurrence of Brownware pottery than by projectile points (Table 6-1). The identification of ethnohistoric sites points to continued use after contact with Euroamericans. The shift in frequency of hunting implements (projectile points) to less mobile artifacts (pottery) fits well with Bettinger and Baumhoff's (1982) hypothesized shift to more intense gathering after about 1200 years ago.

The Co-occurrence of Diagnostics

Archaeological sites, as places in a regional landscape, may be occupied by a series of temporally and culturally different groups as well as by seasonally and functionally different task groups of the same cultural adaptation. Binford (1982) has argued that this occupational redundancy may carry direct information concerning the organization of past systems of cultural adaptation. In order to discern the potential nature of this occupational redundancy at cultural resources in the project area, it is helpful to examine the co-occurrence of temporally diagnostic artifacts.

Table 6-1: Time-markers at archaeological sites in the Groom Range, Lincoln County, Nevada.

Site Type	Site No.	Gr. Basin Stemmed	Pinto	Gate-Cliff	Hum-Boldt	Large S.Notch	Elko	Anasazi	Rose-Gate	Desert	Brown-Ware	Cotton Wood
Temporary Camp	26Ln3076	-	-	-	-	-	1	-	1	-	-	-
	26Ln3077	1	-	-	-	-	-	-	-	-	-	-
	26Ln3078	-	-	-	-	-	-	-	-	-	1	-
	26Ln3080	-	-	-	-	-	-	-	-	-	1	-
	26Ln3084	-	-	-	-	-	1	-	-	-	2	-
	26Ln3093	-	-	-	-	-	-	-	-	-	1	-
	26Ln3094	-	1	2	1	1	2	1	3	-	3	-
	26Ln3097	-	-	-	-	-	-	1	1	-	-	-
	26Ln3117	-	-	-	-	-	1	1	-	-	-	-
	26Ln3123	-	2	-	-	-	1	-	-	-	-	-
	26Ln3124	-	-	-	-	-	1	2	1	-	1	-
	26Ln3126	-	-	-	-	-	-	-	-	-	1	-
	26Ln3129	-	-	-	-	-	1	-	-	-	1	-
	26Ln3133	-	-	-	2	-	3	-	-	-	-	-
	26Ln3134	-	-	-	-	-	-	-	1	-	-	-
	26Ln3135	-	-	-	-	-	1	-	-	-	-	-
	26Ln3143	-	-	-	-	-	-	-	1	-	-	-
	26Ln3308	-	-	-	-	-	-	-	-	1	-	-
	26Ln3314	-	-	-	-	-	-	-	1	-	-	-
	26Ln3331	-	-	-	-	-	1	-	1	-	1	-
Lithic Scatter	26Ln3106	-	-	-	-	-	1	-	1	-	-	-
	26Ln3107	-	-	-	-	-	-	-	-	-	-	1
	26Ln3125	-	-	1	-	-	-	-	-	-	-	-
	26Ln3127	-	1	-	-	-	-	-	-	-	1	-
	26Ln3137	-	1	-	-	-	-	-	-	-	1	-
	26Ln3159	-	-	-	-	-	-	-	1	-	-	-
	26Ln3248	-	-	1	-	-	-	-	-	-	-	-
	26Ln3295	-	1	-	-	-	-	-	-	-	-	-
	26Ln3302	-	-	-	-	-	-	-	1	-	-	-
Locality	26Ln3118	-	-	1	-	-	-	-	-	-	-	-
	26Ln3147	-	-	-	-	-	-	-	-	-	1	-
	26Ln3156	-	-	-	-	-	-	-	1	-	-	-
	26Ln3278	-	1	-	-	-	-	-	-	-	1	-
	26Ln3325	-	1	-	-	-	-	-	-	-	-	-
	26Ln3329	-	-	-	-	-	-	-	-	1	-	-
Isolate	26Ln3087	-	1	-	-	-	-	-	-	-	-	-
	26Ln3110	-	-	-	-	-	-	-	1	-	-	-
	26Ln3161	-	-	-	-	-	1	-	-	-	-	-
	26Ln3256	-	-	-	-	-	1	-	-	-	-	-
	26Ln3299	-	-	-	-	-	1	-	-	-	-	-
TOTAL		1	9	5	3	1	17	5	15	2	16	1

Table 6-2 summarizes the co-occurrence of major temporally diagnostic artifacts at cultural resources in the Groom Range. These data reflect the number of times that diagnostic types were found at the same archaeological site. The co-occurrence of diagnostics at archaeological sites in the Groom Range could be due to a number of factors other than simply the artifacts' coterminous use and discard. Brownware pottery, for example, occurs more frequently with Elko and Pinto Series projectile points than it does with the contemporaneous Cottonwood Series style of arrowpoint. Binford (1982:20) argues that "the more seasonally repetitive the movement of residential sites, the greater the chance for repetitive types of occupations at particular logistical sites." Hence, the co-occurrence of diagnostics in the project area could also be due to the fact that these particular archaeological sites were nodes of activity during different periods of time.

Multidimensional scaling may be used in the identification of this less obvious patterning in the co-occurrence of diagnostics. In this application, Table 6-2 may be conceived of as a table of similarities; i.e,. similarities in the distribution of diagnostics. That is, each entry in the table reflects the distance (in a statistical sense) between diagnostic assemblages based on the co-occurrence of all diagnostics at sites in the research area. Given this assumption, the data matrix can be reasonably analyzed for patterning using multidimensional scaling (Kruskal and Wish 1978). This multivariate statistical procedure produces a graphic representation of the similarities in a data base that may make this data much easier to comprehend. The physical distance between a point on the output scattergram and all other points on the output scattergram replicates the similarities inherent in the input data. The more dissimilar two data points are, the further apart they should be in the spatial map.

Table 6-2: Co-occurrence of temporally diagnostic artifacts at archaeological sites in the Groom Range, Lincoln County, Nevada.

Diagnostic	Cotton Wood	Brown-Ware	Desert	Rose-Gate	Anasazi	Elko	Large S.Notch	Hum-boldt	Gate-Cliff	Pinto
Cottonwood	-									
Brownware	0	-								
Desert	0	0	-							
Rosegate	1	2	0	-						
Anasazi	1	1	0	3	-					
Elko	1	4	0	5	3	-				
Lg S. Notch	0	1	0	1	1	1	-			
Humboldt	0	1	0	1	1	2	1	-		
Gatecliff	0	1	0	1	1	1	1	1	-	
Pinto	0	4	0	1	1	2	1	1	1	-

A brief description of the multidimensional scaling procedure is as follows: In a matrix of similarities between N points it takes N-1 dimensions to exactly represent that similarity matrix. Starting with N-1 dimensions, at each step, a dimension is removed and the data points are moved around in multidimensional space. Every time the points are moved around an error measure is computed that measures the divergence between the original similarities and the spatial distances. This measure is termed stress. When stress stops decreasing a configuration is obtained. The process is then repeated by removing another dimension. The ideal configuration is the one right before the stress increases dramatically. That is, if one plots stress against the number of dimensions, there is usually a change in slope of the line and that change in slope is configuration that one should interpret. Ideally, one would like to interpret the 2 dimensional configuration as the patterning is usually obvious. In this case, stress increases at two dimensions, but does not dramatically increase until 1 dimension (Figure 6-2). We have accepted the somewhat higher stress of 2 dimensions (.00255 after 50 iterations) rather than 3 dimensions (.00044 after 50 iterations) because of simplified interpretation.

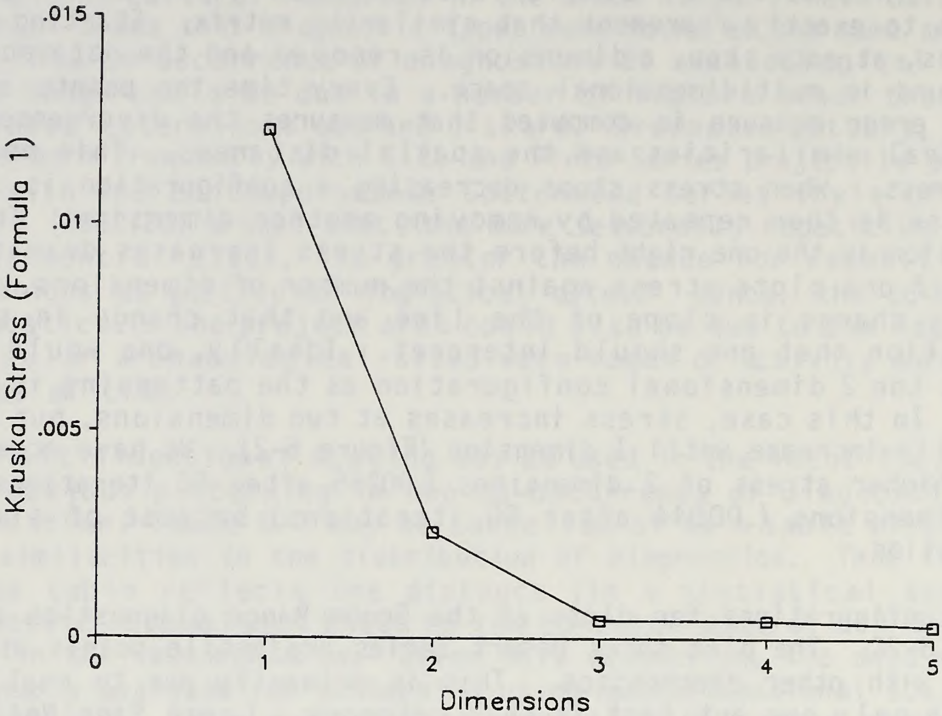
The configurations for plots of the Groom Range diagnostics are shown in Figure 6-2C. The plot shows Desert Series projectile points as not co-occurring with other diagnostics. This is primarily due to small sample size, with only one artifact in this category. Large Side Notched and Gatecliff Series tend to co-occur, and the rest of the diagnostics form another group that co-occurs. This pattern would be expected if there was extensive re-use of the same areas through time, and shows up primarily in sites we have defined as temporary camps. Due to the severely limited sample size of the present data base, it is not possible to define more subtle patterns.

Distribution of Archaeological Remains

Archaeological remains are discontinuously spread over the landscape due to a wide variety of natural and cultural constraints. These patterns of land use make up an important part of studying past human adaptations to the area. Descriptions of major areas with distinct patterns of archaeological remains are summarized below.

High Volcanic Areas and Major Springs

Much of the northern half of the Groom Range has been ideal for aboriginal exploitation. Major sites surround most springs in the northern half of the range. These springs are the most productive in the project area and are located in excellent places for upland resources, primarily pinyon and game. An extremely dense pinyon community occurs upslope of many of the springs, enabling a pinyon procurement strategy of establishing base camps at water sources and moving high to collect nuts. Any nuts that could not easily be transported, could be cached for utilization later. The rock features interpreted to be caches are within an easy days journey of camps at the springs. As an additional benefit, the springs are within the belt of heaviest deer use. The volcanic substrate in most of this area lends itself to high elevation sites due to the abundance of large relatively level saddles. These saddles are heavily used as temporary

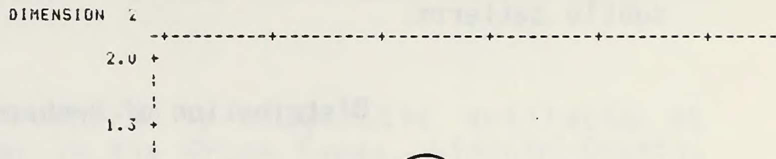


A

COORDINATES IN 2 DIMENSIONS

VARIABLE	PLOT	DIMENSION 1	DIMENSION 2
COTTON	A	-.47	-1.33
BROWN	B	.77	.26
DESERT	C	-2.00	.11
ROSE	D	.71	-.29
ANA	E	.38	-.57
ELKO	F	.62	-.08
LSN	G	-.41	.88
HUMB	H	.16	.20
GATE	I	-.37	.32
PINTO	J	.62	.50

B



C

Figure 6-2: Multidimensional scaling for the co-occurrence of diagnostic artifacts at archaeological sites in the Groom Range, Lincoln county, Nevada. **A.** Stress at all five dimensions. **B.** Coordinates of variables in two dimensions. **C.** Plot of variables in two dimensions.

camps and some contain pinyon caches. Such sites are present as high as 8800 feet on the flanks of Mount Baldy.

Southern Groom Range

By contrast, the southern portion of the range has seen little prehistoric use. This area lacks dense pinyon and water resources. The extreme southern end of the Groom Range possesses bedrock outcrops of chert that have been used as prehistoric toolstone quarries. Quarrying activity has also been present along the upper bajadas below the bedrock sources, increasing site density over the rest of the southern end of the range. Other small quarries occur on the west and east side of the Groom Range.

Groom Lake and Adjacent Sandy Bajada

Small lithic scatters occur on the beach terraces that surround Groom Lake. All these remains apparently postdate the shoreline features. An extensive blanket of aeolian sand blankets the lower bajada north and northwest of Groom Lake. This area as well as those sandy areas around Groom Lake abounds with annuals that are a prime aboriginal food source. Archaeological remains along this bajada also consist mainly of extensive lithic scatters. These scatters most probably reflect the exploitation of annual resources.

Tikaboo Hills and Quartzite Ridge

These north to south ranging sets of hills lack vegetal and water resources. Archaeological remains are sparse except at the base of the hills in small valley bottoms that lead to springs located deeper in the Groom Range.

Future Resource Potential of the Groom Range

The prehistoric sites in the Groom Range are highly significant for study of a variety of research domains, some of which are summarized below.

1. Anasazi and Fremont Periphery: The study area is on the edge of the distribution of artifacts from both of these culture areas. The nature of the influence of these groups is not yet known in any detail. Artifacts may be the result of trade or of sporadic occupations by members of these cultures. Five different styles of Anasazi pottery were found during the survey.

2. Chronology: Despite the significant amount of regional diversity that has been documented in the Great Basin, well controlled dates of time diagnostic artifacts are sparse, especially in this part of Nevada. Excavations of buried sites which will yield artifacts in association of datable items, primarily through radiocarbon analysis, is needed to build a number of local chronologies. The present state of chronology in this area is confusing, primarily due to the need of inferring dates from distant localities. Rockshelters are of special importance for building chronologies because of the accumulation of debris within over time and the

protection afforded perishable items which are needed for carbon dating.

3. Buried Sites: Aside from construction of an adequate local chronology, sites with buried remains are useful for analysis of spatial patterning of aboriginal remains within sites. Features such as houses, caches, roasting pits, and so on are often preserved when buried whereas they normally erode away on surface sites. This is especially the case when the present ground surface has been heavily disturbed by grazing. Small areas of local recent deposition are present throughout the range but two areas are highly significant in this regard. Most spring sites exhibit extensive aboriginal use. The sandy bajada area above Groom Lake also holds a high potential for extensive buried remains.

4. Settlement Pattern Studies: The distribution of all archaeological remains is significant for such studies. Questions that can be approached from the available data include routes of travel, and the local influence of topography on site, and regional patterns. For example, in the Groom Range, the archaeology of the east side springs is generally richer than that of those on the west side. This is especially the case for artifacts such as projectile points and pottery. It may be that this is a result of proximity to aboriginal populations centered on the rich resources of the Pahranagat Valley using the Groom Range as a peripheral resource. The general stability of ground surfaces in the Groom Range indicates that the area may be a useful site for studies of surface artifact distributions within sites.

5. Hunting: The Groom Range is, or was in the past, good habitat for bighorn sheep, deer, and antelope. Upland sites relating to this activity include isolated projectile points and tools, hunting blinds, and loci within temporary camps and residential bases. Rabbit drives were probably staged on the bajadas and in wider valleys. Although the large canyons entering the Groom Range from Emigrant, Tikaboo, and Sand Springs Valleys were not examined as part of this sample, there is a possibility that game drive fences are present in these areas.

6. Paleoecological Studies: The relationship of man and environment in the Great Basin is a close one, and one that has been shown to have much local diversity. The Groom Range provides many opportunities to expand our knowledge in this area due to the presence of many preserved packrat middens, notably the large one within Snowslide Cave, and the presence of trees, notably *Pinus flexilis*, which may be used for tree ring analysis for paleoclimates as well as dendrochronology.

7. Pinyon Exploitation: There is evidence of varying use of upland pinyon resources through time. Dating of cache sites is possible through comparison of associated artifacts, carbon dates from related temporary camps, and carbon dates from within caches which have also been used as roasting pits.

8. Rock Art: Three pictograph sites were found during the reconnaissance. All are associated with other cultural remains, and may be significant for future use in studies designed to tie rock art sites more closely with the physical and cultural environment.

9. Ethnohistoric Sites: Historic aboriginal sites are present in the study area. These sites include pinyon caches, rock shelters and many of the spring sites. These sites provide an unusual research opportunity because this is a situation where a hunting and gathering population is in operation within comparatively well known times. This enables creation of behavioral models from a well documented historic base line for application to other hunting and gathering societies in the remote past.

10. Historic Sites: Historic sites in the Groom Range relate primarily to mining, ranching, transportation, and logging. The most significant historic research potential in the Groom Range relates to the long-term use of the Groom Mine and continued occupation by the Sheahans. This provides a valuable opportunity to study a remote, small mining operation utilizing the three databases of documents, oral history, and archaeology.

7. MANAGEMENT RECOMMENDATIONS

The cultural resources reconnaissance of the Groom Range was undertaken in order to assist the U.S. Air Force in the decision making process concerning the protection of significant cultural resources in the renewed withdrawal area. This reconnaissance provided a representative sample of the kinds of cultural resources that occur in the project area and, thereby, may be used for the establishment of management plans that are specifically tailored to those kinds of archaeological sites as well as to the kinds of potential impacts that may affect those sites. The following recommendations are provided in support of those management plans.

Effects and Impacts

In order to protect the significant cultural resources of the Groom Range withdrawal area from adverse impact, it is first necessary to have a clear idea of what might and might not be considered adverse impacts. Following Schiffer and Gummerman (1977:291-301) we may first distinguish between effects and impacts. Effects are the events, activities and processes related directly or indirectly to the U. S. Air Force's activities in the withdrawal area that have potential for altering archaeological resources. Whether or not the potential for disturbance or destruction is realized, _i.e._, becomes an adverse impact, depends on the specific cultural resources present and the nature of the particular disturbance processes. Similarly, not all effects should be considered as being adverse.

It is useful to consider potential adverse effects under separate categories: direct and indirect. Direct effects are those obviously connected to the U.S. Air Force's principal mission in the withdrawal area. Examples of these effects would be such things as the construction of roads, fences, gravel pits, powerlines, buildings, etc. Indirect effects of the renewed land withdrawal are harder to define, but might include such things as the unauthorized collecting of artifacts by U.S. Air Force personnel or their contractors, fires caused by aircraft crashes, changes in land use and accessibility, increased erosion of sites due to changes in drainage patterns around construction areas, etc. These indirect effects may or may not occur within the boundaries of a project area.

Since the Air Force is renewing the withdrawal of the Groom Range as a buffer zone, there are few potential activities that may directly affect cultural resources in the project area. This general lack of envisioned direct impacts, combined with the exclusion of the public from the area with a consequent reduction of potential collection and vandalism of archaeological sites, makes the withdrawal beneficial for the preservation of cultural resources in the Groom Range. However, construction of roads, powerlines, remote stations, and possibly a perimeter fence may occur in the future and these activities would have to potential to directly affect significant cultural resources. The Class II reconnaissance conducted by DRI has not cleared any areas of potential adverse impacts on cultural resources, thus all future land-disturbing activities by the Air Force should be preceded by a reconnaissance and if necessary, mitigation of impacts in projected areas of disturbance. General guidelines for administering the cultural resources and insuring against future damage should be developed in conjunction with the Nevada State Historic Preservation Office. An excellent model of such guidelines is that of the BLM in Nevada (Bureau of Land Management 1985). The Air Force currently plans to cooperate with the BLM in managing the cultural resources of the withdrawal area (DEIS 4-19).

Indirect impacts to archaeological remains in the Groom Range also should be guarded against. As mentioned above such impacts may include the collection of artifacts by personnel in the area, and overgrazing of the project area with attendant damage to archaeological sites. Air Force personnel should be informed of the Archaeological Resources Protection Act of 1979 and off road vehicular travel should be discouraged or prohibited. Another important indirect impact of the renewed land withdrawal is the removal of access to the Groom Range for future scientific research. The cultural resources reconnaissance has only recovered limited data from the 6 percent of the project area that was sampled and has left 94 percent of the range virtually unknown. Although it is obvious that the Air Force cannot allow unrestricted access into this area if it is to serve its purpose as a buffer zone, it is hoped that limited access can be negotiated should it be required to pursue significant archaeological, paleoenvironmental, or biogeographical research projects. Presently, the Air Force is adverse to such controlled access (DEIS 4-20).

Significance

The National Historic preservation Act of 1966, Sec. 101(a)(1), imposes certain requirements regarding significant resources. Consequently, it is important to determine what is conveyed by the term "significance." Federal Regulations (36 CFR 60.6 and 36 CFR 800.10) state that:

> ...The quality of significance in American history, architecture, archaeology, and culture is present in districts, sites, buildings, structures, and objects of State and local importance that possess integrity of location, design, setting, materials, workmanship, feeling, and association, and
>
> (a) That are associated with events that have made a significant contribution to the broad patterns of our history; or
>
> (b) That are associated with the lives of persons significant in our past; or
>
> (c) That embody the distinctive characteristics of a type, period, or method of construction, or that represent the work of a master, or that possess high artistic values, or that represent a significant and distinguishable entity whose components may lack individual distinction; or
>
> (d) That have yielded, or may be likely to yield, information important in prehistory or history.

These criteria, used by Federal agencies in assessing eligibility of cultural resources for nomination to the National Register, provide a general mechanism for defining significance, but most of these criteria were written with historic buildings in mind and not prehistoric archaeological sites. The last criterion (d) is applicable for determining significance of prehistoric cultural resources in the Groom Range.

Given the nature of the archaeological remains present in the Groom Range, few would be eligible for nomination to the National Register when considered individually, but in the aggregate, all or related subsets of the sites may be eligible on a regional basis. The State Historic Preservation Office should be consulted concerning the possibility of the nomination of the project area as a district. Significance of all archaeological sites within the Groom Range project boundaries was assessed according to BLM CRES rating standards which are as follows:

S1. These sites have clear potential for public instruction or for yielding scientific information of importance on the national, State, or local level; have important connections with major historical events or personages; and/or possess cultural value for segments of the modern population. Most aboriginal sites falling into this category will be in relatively good condition and will either be rare or unique (e.g., Early Man) or will be large and particularly well-representative of their types.

S2. This rating applies if the criteria for S1 rating are only minimally met. The site is generally in good condition and further evaluation could lead to reassessment. S2 sites are usually not unique or very rare, lack important historical associations and are not particularly well-representative of their types. Aboriginal camps or villages which are large but do not have great antiquity and have only limited depth potential are suitable for this rating. Typical S2 historic sites include recently abandoned ranches, small mining camps, cemeteries, railbeds, roads, and trails.

S3. Typically, S3 sites show little depth, no or very few features and, if old, are small, or if large, are comparatively recent and diffuse. The site may have been damaged by recent activities, but some scientific or educational value remains. In general, a site not rated S1 or S2 but still partly or wholly extant, will be S3 rated. Common aboriginal S3 sites include seasonal camps, hunting and gathering activity areas, isolated lithic artifacts or potsherds, chipping stations, and lithic workshops and quarries; common historic period S3 sites include dumps, isolated buildings and other structures and small mining operations.

S4. These sites no longer exist, because of vandalism, illicit collection or commercial destruction or because of archaeological collection or excavation.

The recommended CRES rating for each site is included in Table 5-1. There is an excellent potential for S1 rated sites to be eligible for the National Register and some S2 sites may also be eligible. S1 and S2 rated sites in the Groom Range are listed in Table 7-1.

Table 7-1: Archaeological sites in the Groom Range with a significance rating of S1 or S2.

S1	S2		
26Ln3097	26Ln3076	26Ln3123	26Ln3218
26Ln3121	26Ln3077	26Ln3124	26Ln3248
26Ln3283	26Ln3078	26Ln3135	26Ln3260
	26Ln3084	26Ln3144	26Ln3295
	26Ln3087	26Ln3145	26Ln3296
	26Ln3094	26Ln3170	26Ln3310
	26Ln3105	26Ln3186	26Ln3331

The most significant single site in the Groom Range is the Groom Mine (26Ln3283). This property is not currently owned by the Air Force. Should the property be acquired by the Air Force it will require special protection and preservation measures and should be nominated to the National Register of Historic Places.

Recommended Procedures

It is recommended that the U.S. Air Force, in conjunction with the U.S. Department of Interior, Bureau of Land Management and the Nevada Division of Historic Preservation and Archaeology develop a cultural resources management plan for the future protection of significant cultural resources in the Groom Range. This management plan should, at the minimum, address the following issues.

1. Preconstruction surveys should precede all land disturbing activities in the withdrawal area that have the potential to adversely affect significant cultural resources. These preconstruction surveys should:

    a. be conducted by qualified, professional archaeologists who meets membership requirements of the Society of Professional Archaeologists or the Secretary of Interior's Professional Qualifications Standards.

    b. evaluate the significance of all identified cultural resources according to research domains outlined in Nevada's State Historic Preservation Plan's "An Archaeological Element" (1982) and criteria presented in Section 60.6 of 36 CFR Part 60.

c. identify potential direct and indirect effects of U.S. Air Force activities on both on-site and off-site areas housing significant cultural resources.

d. be reported to the Nevada Division of Historic Preservation and Archaeology via cultural resources reconnaissance short reports or similar formal written reports.

2. If feasible, the U.S. Air Force should attempt to locate their activities in such a manner as to avoid adverse effects to significant cultural resources. If avoidance of damage to significant cultural resources is not possible, the U.S. Air Force should develop and implement data recovery plans in accordance with the Secretary of the Interior's "Standards and Guidelines for Archeological Documentation" and the Council's Handbook on "Treatment of Archeological Properties."

3. The U.S. Air Force should consult with the Nevada Division of Historic Preservation and Archaeology concerning any actions that have a potential to affect significant cultural resources in the withdrawal area.

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LVRJ = Las Vegas Review Journal, Las Vegas
PR = Pioche Record, Pioche
TE = Territorial Enterprise, Virginia City

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APPENDIX A:

Sample Quadrat Summary

Sample Quadrat Summary for the Groom Range Survey, Lincoln County, Nevada.

Quadrat	Person Days	Aspect	Elevation Max.	Elevation Min.	Bedrock Primary	Bedrock Secondary	Macrotopography	Microtopography Primary-1	Microtopography Primary-2	Kilometers to Nearest Spring	Vegetation Zone	Site Number	Collected	Site Type	Diagnostics
1	2.0	North	6560	6120	Volcanic		Mountain-Side	Foothill	Valley	5.2	Pinyon-Juniper				
2	2.0	North	7240	7000	Volcanic	Quartzite	Mountain-Side	Foothill	Ridge	2.8	Pinyon-Juniper	26Ln3326	No	Lithic Scatter	
												26Ln3327	No	Locality	
												26Ln3328	No	Knapping Station	
												26Ln3329	Yes	Locality	Desert
3	2.0	North	6880	6720	Quartzite		Mountain-Side	Ridge	Valley	2.2	Pinyon-Juniper	26Ln3324	No	Locality	
4	2.0	North	6600	6400	Quartzite		Mountain-Edge	Knoll		2.7	Sagebrush				
5	1.0	North	8100	7400	Quartzite		Mountain-Top	Peak		1.6	Pinyon-Juniper	26Ln3321	No	Cache	
												26Ln3322	No	Temporary Camp	
												26Ln3323	No	Temporary Camp	
6	1.0	West	6360	6100	Volcanic		Mountain-Edge	Ridge	Slope	2.2	Sagebrush	26Ln3315	No	Isolate	
												26Ln3316	No	Isolate	
												26Ln3317	No	Isolate	
												26Ln3318	No	Isolate	
												26Ln3319	No	Isolate	
												26Ln3320	No	Isolate	
7	2.0	East	8080	7520	Quartzite	Carbonate	Mountain-Top	Valley		1.4	Pinyon-Juniper	26Ln3311	No	Locality	
												26Ln3312	No	Cache	
												26Ln3313	No	Cache	Historic
												26Ln3314	Yes	Temporary Camp	Rosegate
8	2.0	East	6800	6500	Carbonate	Volcanic	Mountain-Side	Ridge	Valley	2.8	Sagebrush	26Ln3080	Yes	Temporary Camp	Brownware
												26Ln3082	No	Other Historic	Historic
9	3.0	East	5900	5780	Alluvium	Carbonate	Mountain-Edge	Fan-Interior	Spring-Base	0.6	Sagebrush	26Ln3083	No	Isolate	
												26Ln3084	Yes	Temporary Camp	2 Brownware/Elko
10	2.0	East	6600	6440	Alluvium		Mountain-Edge	Foothill-Base	Fan	2.1	Sagebrush	26Ln3310	Yes	Lithic Scatter	Rosegate
11	2.0	East	7080	6800	Quartzite		Mountain-Side	Ridge		0.9	Pinyon-Juniper				
12	1.0	Northeast	5400	5300	Alluvium		Mountain-Edge	Fan		1.6	Sagebrush	26Ln3087	Yes	Isolate	Pinto
13	1.0	Southeast	7650	7180	Volcanic		Mountain-Side	Ridge	Valley	2.6	Pinyon-Juniper	26Ln3096	No	Temporary Camp	
												26Ln3098	No	Locality	

Sample Quadrat Summary for the Groom Range Survey, Lincoln County, Nevada. (cont'd)

Quadrat	Person Days	Aspect	Elevation Max.	Elevation Min.	Bedrock Primary	Bedrock Secondary	Macrotopography	Microtopography Primary-1	Microtopography Primary-2	Kilometers to Nearest Spring	Vegetation Zone	Site Number	Collected	Site Type	Diagnostics
14	3.0	East	6000	5900	Volcanic		Mountain-Edge	Fan	Ridge	0.4	Sagebrush	26Ln3085	No	Isolate	
												26Ln3086	Yes	Lithic Scatter	Rosegate
												26Ln3088	No	Temporary Camp	
												26Ln3089	No	Isolate	
												26Ln3090	No	Isolate	
												26Ln3091	Yes	Ranching	Historic
												26Ln3092	No	Lithic Scatter	
15	4.0	Northeast	6600	6300	Alluvium	Volcanic	Mountain-Side	Foothill-Bottom	Slope	1.6	Sagebrush	26LN3093	Yes	Temporary Camp	Brownware
												26Ln3094	Yes	Temporary Camp	4 Brownware/3 Rosegate/ 2 Elko/2 Gatecliff/ Humboldt/Large Side-Notched/Pinto
16	2.0	Northeast	5300	5200	Alluvium	Volcanic	Mountain-Edge	Fan	Ridge	2.9	Sagebrush				
17	3.0	North	7000	6360	Quartzite		Mountain-Side	Peak		3.6	Sagebrush	26Ln3309	No	Temporary Camp	
18	2.0	North	6800	6600	Alluvium		Mountain-Side	Fan		1.7	Sagebrush	26Ln3308	Yes	Temporary Camp	Desert
19	2.0	North	7550	7100	Volcanic		Mountain-Side	Ridge	Valley	1.0	Pinyon-Juniper	26Ln3099	No	Isolate	
												26Ln3100	No	Locality	
												26Ln3101	No	Isolate	Historic
												26Ln3102	No	Locality	
												26Ln3103	No	Locality	
												26Ln3104	No	Cache	
20	2.0	Southeast	6600	6200	Alluvium	Volcanic	Mountain-Side	Fan	Foothill-Bottom	2.1	Sagebrush	26Ln3106	Yes	Locality	Rosegate/Elko
												26Ln3107	Yes	Lithic Scatter	Desert
												26Ln3108	No	Isolate	
												26Ln3111	No	Lithic Scatter	
												26Ln3112	No	Isolate	
21	2.0	Northeast	5825	5585	Alluvium	Volcanic	Mountain-Edge	Fan	Knoll-Top	2.5	Sagebrush	26Ln3109	No	Locality	
												26Ln3110	Yes	Isolate	Rosegate
22	1.0	North	5700	5550	Volcanic		Mountain-Edge	Foothill	Slope	2.2	Sagebrush	26Ln3170	No	Quarry	
23	1.0	Southwest	6800	6240	Quartzite		Mountain-Side	Valley	Ridge	3.9	Blackbrush				
24	1.0	South	6520	6250	Other		Mountain-Side	Valley	Ridge	2.5	Sagebrush	26Ln3307	No	Other Historic	

Sample Quadrat Summary for the Groom Range Survey, Lincoln County, Nevada. (cont'd)

Quadrat	Person Days	Aspect	Elevation Max.	Elevation Min.	Bedrock Primary	Bedrock Secondary	Macrotopography	Microtopography Primary-1	Microtopography Primary-2	Kilometers to Nearest Spring	Vegetation Zone	Site Number	Collected	Site Type	Diagnostics
25	2.0	West	6800	6550	Alluvium	Volcanic	Mountain-Side	Fan	Foothill-Edge	0.9	Sagebrush	26Ln3299	Yes	Isolate	Elko
												26Ln3300	No	Locality	
												26Ln3301	No	Lithic Scatter	
												26Ln3302	Yes	Lithic Scatter	
												26Ln3303	No	Lithic Scatter	
												26Ln3304	No	Isolate	
												26Ln3305	No	Isolate	
												26Ln3306	No	Isolate	
26	5.0	North	8050	7400	Volcanic	Alluvium	Mountain-Side	Valley-Bottom	Ridge-Base	2.3	Pinyon-Juniper	26Ln3120	No	Temporary Camp	
												26Ln3121	No	Temporary Camp	
27	1.0	North	5900	5400	Volcanic		Mountain-Edge	Foothill	Slope	2.0	Sagebrush				
28	3.5	East	6800	6300	Volcanic	Alluvium	Mountain-Side	Fan-Head	Spring-Head	0.0	Pinyon-Juniper	26Ln3123	Yes	Temporary Camp	Elko/2 Pinto
												26Ln3124	Yes	Temporary Camp	2 Grayware/Rosegate/Elko
29	2.0	North	5950	5790	Alluvium	Volcanic	Mountain-Edge	Peak	Alluv. Terrace	0.9	Sagebrush	26Ln3125	Yes	Lithic Scatter	Gatecliff/Humboldt
												26Ln3126	Yes	Temporary Camp	Brownware
												26Ln3127	Yes	Lithic Scatter	Brownware/Pinto
												26Ln3130	No	Knapping Station	
30	3.0	North	8600	8175	Volcanic	Carbonate	Mountain-Top	Ridge-Top	Slope-Head	1.9	Pure Pinyon	26Ln3133	Yes	Temporary Camp	3 Elko/Humboldt
31	2.0	North	6520	6200	Volcanic		Mountain-Side	Ridge	Valley	2.0	Sagebrush	26Ln3298	No	Lithic Scatter	
32	1.0	Northeast	6200	5900	Volcanic		Mountain-Edge	Ridge	Ridge-Top	1.4	Sagebrush				
33	2.0	North	7000	6600	Volcanic		Mountain-Side	Foothill-Interior		1.4	Pinyon-Juniper				
34	2.0	North	5900	5800	Volcanic		Mountain-Edge	Ridge	Foothill	1.5	Sagebrush	26Ln3131	No	Isolate	
35	2.0	North	8000	7200	Volcanic		Mountain-Side	Valley		1.0	Pinyon-Juniper	26Ln3135	Yes	Temporary Camp	Elko
36	3.0	South	8100	7300	Volcanic		Mountain-Side	Slope	Ridge-Top	2.2	Pure Pinyon				
37	2.0	East	6400	6200	Alluvium		Mountain-Side	Fan		1.9	Sagebrush	26Ln3137	Yes	Lithic Scatter	Brownware/Pinto
38	1.0	North	6000	5600	Volcanic		Mountain-Edge	Valley	Ridge	2.7	Sagebrush				
39	2.0	South	6320	6120	Alluvium	Volcanic	Mountain-Side	Fan		1.7	Sagebrush	26Ln3290	No	Lithic Scatter	
												26Ln3291	No	Lithic Scatter	
												26Ln3292	No	Lithic Scatter	
												26Ln3293	No	Locality	
												26Ln3294	No	Locality	
40	3.0	West	5960	5820	Alluvium		Mountain-Side	Alluv. Terrace		0.5	Sagebrush	26Ln3295	Yes	Lithic Scatter	Historic/Pinto

Sample Quadrat Summary for the Groom Range Survey, Lincoln County, Nevada. (cont'd)

Quadrat	Person Days	Aspect	Elevation Max.	Elevation Min.	Bedrock Primary	Bedrock Secondary	Macrotopography	Microtopography Primary-1	Microtopography Primary-2	Kilometers to Nearest Spring	Vegetation Zone	Site Number	Collected	Site Type	Diagnostics
41	2.0	East	6400	6100	Alluvium		Mountain-Side	Fan		0.5	Sagebrush	26Ln3140	No	Isolate	
												26Ln3141	Yes	Locality	
												26Ln3145	Yes	Lithic Scatter	
												26Ln3147	Yes	Locality	Brownware
												26Ln3148	No	Isolate	
												26Ln3149	No	Isolate	
												26Ln3150	No	Locality	
												26Ln3151	No	Locality	
												26Ln3152	No	Isolate	
												26Ln3153	No	Isolate	
42	4.0	East	5850	5590	Alluvium	Quartzite	Mountain-Edge	Fan	Ridge-Interior	3.5	Sagebrush	26Ln3154	No	Isolate	
												26Ln3155	No	Isolate	
												26Ln3157	Yes	Isolate	
												26Ln3158	No	Isolate	
												26Ln3159	Yes	Lithic Scatter	Rosegate
												26Ln3160	Yes	Isolate	
												26Ln3161	Yes	Isolate	Elko
43	1.0	West	6360	5600	Volcanic		Mountain-Side	Slope-Interior	Fan-Top	4.7	Sagebrush	26Ln3162	No	Isolate	
44	1.0	West	5600	5320	Alluvium		Mountain-Edge	Fan	Foothill-Base	3.5	Blackbrush	26Ln3289	No	Isolate	
45	1.0	North	6600	6240	Quartzite	Alluvium	Mountain-Side	Slope		3.8	Pinyon-Juniper				
46	1.0	North	7800	7000	Carbonate		Mountain-Top	Ridge	Valley	2.6	Mahogony/Pinyon-Juniper				
47	1.0	South	6100	5800	Carbonate	Volcanic	Mountain-Side	Valley-Interior	Ridge-Top	3.5	Sagebrush	26Ln3164	No	Isolate	
												26Ln3165	No	Locality	
												26Ln3166	No	Milling Station	
												26Ln3167	No	Isolate	
48	1.5	North	6700	6500	Quartzite	Carbonate	Mountain-Side	Valley	Ridge-Top	4.0	Sagebrush	26Ln3169	No	Other Historic	Historic
49	2.0	North	5880	5600	Quartzite		Mountain-Side	Fan	Foothill-Base	4.1	Sagebrush	26Ln3287	No	Locality	
												26Ln3288	No	Isolate	
50	2.0	East	7200	6800	Carbonate		Mountain-Side	Ridge	Valley	3.7	Pinyon-Juniper				
51	1.0	Southeast	5800	5600	Alluvium	Carbonate	Mountain-Edge	Fan-Interior	Ridge-Interior	4.5	Blackbrush	26Ln3172	No	Isolate	
52	2.0	North	6150	5950	Alluvium		Mountain-Side	Fan	Foothill-End	4.1	Sagebrush	26Ln3173	Yes	Lithic Scatter	
53	1.0	North	5700	5500	Carbonate	Quartzite	Mountain-Edge	Ridge-Interior	Valley-Interior	6.5	Blackbrush	26Ln3179	No	Isolate	
54	1.5	North	6200	5800	Other	Quartzite	Mountain-Side	Foothill	Slope	2.9	Blackbrush				
55	1.0	North	6400	6160	Quartzite	Volcanic	Mountain-Side	Valley-Interior		2.6	Sagebrush				

Sample Quadrat Summary for the Groom Range Survey, Lincoln County, Nevada. (cont'd)

Quadrat	Person Days	Aspect	Elevation Max.	Elevation Min.	Bedrock Primary	Bedrock Secondary	Macrotopography	Microtopography Primary-1	Microtopography Primary-2	Kilometers to Nearest Spring	Vegetation Zone	Site Number	Collected	Site Type	Diagnostics
56	1.0	Southeast	5300	5300	Alluvium	Volcanic	Mountain-Edge	Fan-Interior	Ridge-Interior	6.2	Blackbrush	26Ln3175	No	Isolate	
												26Ln3176	No	Lithic Scatter	
												26Ln3177	No	Isolate	
												26Ln3178	No	Isolate	
57	0.0	North	6600	6000	Other		Mountain-Side	Ridge	Slope	2.7	Pinyon-Juniper				
58	2.0	Southeast	5600	5400	Alluvium	Carbonate	Mountain-Edge	Foothill	Cliff-Base	6.2	Blackbrush	26Ln3180	No	Locality	
												26Ln3181	No	Isolate	
59	1.0	North	5880	5240	Quartzite		Mountain-Side	Foothill		3.7	Blackbrush	26Ln3286	Yes	Mining	Historic
60	2.0	Southwest	5880	5640	Other	Volcanic	Mountain-Side	Ridge		1.1	Blackbrush				
61	1.0	Southeast	5300	5200	Volcanic	Carbonate	Mountain-Edge	Fan-Interior	Knoll	7.3	Blackbrush	26Ln3183	No	Knapping Station	
												26Ln3184	No	Isolate	
62	1.5	South	5840	5520	Alluvium	Other	Mountain-Side	Foothill	Floodplain	1.0	Blackbrush				
63	2.0	Southwest	5300	5200	Volcanic		Mountain-Edge	Pediment	Valley-Interior	8.5	Blackbrush				
64	2.0	North	6100	5650	Carbonate		Mountain-Side	Ridge	Slope	2.9	Blackbrush				
65	1.0	West	5680	5400	Quartzite		Mountain-Side	Ridge	Valley	2.1	Blackbrush	26Ln3284	No	Isolate	
												26Ln3285	Yes	Locality	Elko
66	2.0	South	5600	5280	Alluvium		Mountain-Edge	Fan	Foothill-Base	5.0	Blackbrush	26Ln3195	No	Locality	
												26Ln3196	No	Locality	
												26Ln3197	No	Knapping Station	
67	1.5	Southwest	5240	5120	Alluvium	Other	Mountain-Side	Fan	Slope	0.9	Blackbrush	26Ln3280	No	Lithic Scatter	
												26Ln3281	No	Isolate	
68	2.0	Southwest	5600	5200	Carbonate		Mountain-Side	Ridge	Valley	1.0	Blackbrush	26Ln3187	No	Lithic Scatter	
												26Ln3188	No	Locality	
												26Ln3189	No	Locality	
												26Ln3190	No	Quarry	
												26Ln3191	Yes	Isolate	
												26Ln3192	No	Locality	
												26Ln3193	No	Knapping Station	
												26Ln3215	No	Lithic Scatter	
69	1.0	South	5400	5300	Volcanic		Mountain-Edge	Valley-Edge	Ridge-Edge	8.5	Blackbrush	26Ln3204	No	Lithic Scatter	
												26Ln3205	No	Locality	
												26Ln3206	No	Lithic Scatter	
												26Ln3207	No	Isolate	

Sample Quadrat Summary for the Groom Range Survey, Lincoln County, Nevada. (cont'd)

Quadrat	Person Days	Aspect	Elevation Max.	Elevation Min.	Bedrock Primary	Bedrock Secondary	Macrotopography	Microtopography Primary-1	Microtopography Primary-2	Kilometers to Nearest Spring	Vegetation Zone	Site Number	Collected	Site Type	Diagnostics
70	2.5	Southwest	5200	5150	Volcanic		Mountain-Edge	Fan-Interior	Slope	7.5	Mixed Mojave	26Ln3199	No	Lithic Scatter	
												26Ln3201	No	Lithic Scatter	
												26Ln3202	Yes	Isolate	
												26Ln3203	Yes	Isolate	
												26Ln3208	No	Lithic Scatter	
												26Ln3210	Yes	Isolate	
71	1.5	Southeast	4940		Alluvium	Quartzite	Mountain-Edge	Fan		0.5	Blackbrush	26Ln3274	No	Isolate	
												26Ln3275	No	Isolate	
												26Ln3276	No	Lithic Scatter	
72	1.0	South	5200	5000	Alluvium		Mountain-Edge	Fan-Interior	Pediment	5.0	Blackbrush	26Ln3211	No	Knapping Station	
												26Ln3212	No	Isolate	
73	1.5	Southwest	4960	4720	Alluvium	Volcanic	Mountain-Side	Fan	Knoll-Base	0.9	Blackbrush	26Ln3268	No	Locality	
												26Ln3269	No	Isolate	
												26Ln3270	No	Isolate	
												26Ln3271	No	Mining	
												26Ln3272	No	Isolate	
												26Ln3273	No	Locality	
												26Ln3278	Yes	Locality	Pinto
												26Ln3279	No	Lithic Scatter	
74	1.0	South	5000	4800	Alluvium	Carbonate	Mountain-Side	Fan-Interior	Ridge-Edge	2.1	Mixed Mojave	26Ln3266	No	Locality	
75	1.0	Southwest	5000	4850	Alluvium		Mountain-Edge	Bajada-Interior		2.8	Mixed Mojave	26Ln3214	No	Lithic Scatter	
												26Ln3216	No	Knapping Station	
												26Ln3217	No	Lithic Scatter	
76	1.0	North	5600	5300	Carbonate	Alluvium	Mountain-Edge	Ridge-Top	Slope-Interior	8.2	Blackbrush	26Ln3246	No	Isolate	
77	2.0	West	4820	4780	Alluvium		Mountain-Edge	Fan-Interior	Slope-Interior	6.0	Mixed Mojave	26Ln3238	No	Isolate	
												26Ln3239	No	Isolate	
												26Ln3240	No	Locality	
												26Ln3241	No	Lithic Scatter	
												26Ln3242	No	Isolate	
78	1.5	South	4600	4500	Alluvium		Bolson-Edge	Fan-Interior	Slope-Interior	3.0	Mixed Mojave	26Ln3257	No	Isolate	
												26Ln3258	No	Isolate	
												26Ln3259	No	Isolate	
												26Ln3260	No	Transportation	Historic
												26Ln3261	No	Lithic Scatter	
79	2.0	Southwest	4480	4440	Alluvium		Bolson-Edge	Playa-Edge	Dune-Bottom	2.8	Mixed Mojave	26Ln3263	No	Locality	
80	1.0	Southwest	4700	4600	Alluvium		Bolson-Edge	Bajada-Interior		4.0	Mixed Mojave	26Ln3219	Yes	Lithic Scatter	
81	3.0	West	5300	5100	Alluvium	Other	Mountain-Edge	Foothill	Knoll	8.5	Mixed Mojave				

Sample Quadrat Summary for the Groom Range Survey, Lincoln County, Nevada. (cont'd)

Quadrat	Person Days	Aspect	Elevation Max.	Elevation Min.	Bedrock Primary	Bedrock Secondary	Macrotopography	Microtopography Primary-1	Microtopography Primary-2	Kilometers to Nearest Spring	Vegetation Zone	Site Number	Collected	Site Type	Diagnostics
B2	4.0	West	4700	4600	Alluvium		Bolson-Edge	Bajada-Interior		5.5	Mixed Mojave	26Ln3220	No	Lithic Scatter	
												26Ln3221	No	Locality	
												26Ln3222	No	Lithic Scatter	
												26Ln3223	No	Lithic Scatter	
												26Ln3224	No	Lithic Scatter	
												26Ln3247	No	Isolate	
												26Ln3248	Yes	Lithic Scatter	Gatecliff
												26Ln3249	No	Locality	
B3	3.0	West	4750	4700	Alluvium		Bolson-Edge	Fan		6.7	Mixed Mojave	26Ln3226	No	Isolate	
												26Ln3227	No	Isolate	
												26Ln3228	No	Isolate	
												26Ln3229	No	Knapping Station	
												26Ln3230	No	Locality	
												26Ln3231	No	Locality	
												26Ln3232	No	Isolate	
												26Ln3233	No	Isolate	
												26Ln3234	No	Isolate	
												26Ln3235	No	Knapping Station	
												26Ln3236	No	Isolate	
B4	2.0	Northwest	4900	4800	Alluvium		Mountain-Edge	Fan	Ridge	7.7	Mixed Mojave	26Ln3243	No	Isolate	
												26Ln3244	No	Isolate	
												26Ln3245	No	Isolate	
B5	1.5	North	4438	4438	Alluvium		Bolson-Bottom	Playa-Interior		4.3	Saltbush				
B6	3.0	Southwest	4460	4440	Alluvium		Bolson-Edge	Dune-Toe	Beach Terrace-Top	4.7	Saltbush	26Ln3250	No	Locality	
												26Ln3251	No	Lithic Scatter	
												26Ln3252	No	Lithic Scatter	
												26Ln3253	No	Locality	
												26Ln3254	No	Locality	
												26Ln3255	No	Lithic Scatter	
												26Ln3256	Yes	Isolate	Elko